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CANADIAN SOCIETY OF ANAESTHETISTS

THIRD ANNUAL MEETING

June 12th., 13th., and 14th., 1923

Jointly with the

CANADIAN MEDICAL ASSOCIATION

at the

MOUNT ROYAL HOTEL, MONTREAL

The programme will include demonstrations in the Laboratories of McGill University, anaesthesia clinics in the Hospitals of Montreal, and papers by prominent research workers and leading anaesthetists.

The visiting ladies will be especially entertained.

Further information may be obtained from

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THE IMPORTANCE OF THE EMOTIONAL OR PSYCHICAL NATURE OF PEOPLE IN GENERAL IN THE PRACTICE OF MEDICINE IN ITS WIDEST SENSE*

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THAT the psychical or emotional condition has much influence on patients generally must be evident to anyone who gives it consideration. In the daily life of all it plays its part in affecting the outlook. We have only to observe the effect of disappointment, fear, and joy to make plain this fact. Is it not well illustrated in the child who is relieved by the "kiss to make it well?" and "we are but children of larger growth." As a matter of fact, the unrelieved disturbed emotional condition may and often has serious effect on both mental and physical health which may lead to dire consequences. This is strikingly shown in the many cases resulting from the war. Notwithstanding this, it receives scant consideration in the practice of medicine. This is due chiefly to a defect in the training of the student before graduation and its effect in his practice after. As a result of education the practice of medicine in the past was confined to physical ailments, and for their relief, drugs, too often unpleasant and often drastic, were relied on. To this homeopathy chiefly owed its origin; its decay has kept pace with the rise and progress of rational medicine. In this progress, general medicine has been still concerned with physical diseases, mental and psychical affections being relegated to the alienists who have now adopted the name psychiatrists, though still too often confining their attention to mental disturbances.

Ailments of emotional origin may affect any function of the body and cause as great a variety of symptoms, such as slight or severe pains, loss of weight and vigour, insomnia, disturbed digestion, marked constipation and many others. In the war cases, in addition to milder complaints, were blindness, deafness, paralysis, aphasia, loss of memory, etc. In civil life these severe effects have been met with but the vast majority are milder. The physician's attention is usually focussed on the symptoms of which most complaint is made and a physical cause is sought for, the possible psychical cause receiving no consideration. In some cases without a local complaint it may be difficult to trace to their origin and make sure of their cause and relationship to the symptoms. There may be a secret sorrow which they will not reveal; others enjoy their ill health too much to give up the key to the problem. In many if not most cases, however, the psychical disturbance is easily discerned if its possible existence is only kept in mind. Once found, an assurance of relief will usually gain the confidence and cooperation of the patient, and with satisfactory results; especially, if there is a strong wish to get well. In such cases, the charlatan often has the advantage. He does not concern himself with history or examination but announces a simple cause that rarely exists and gives assurance of a prompt cure. If he secures the confidence and cooperation of the patient, as he usually does because he appeals to his vanity, the symptoms are often promptly relieved. It is the psychical impression, not the means used, that affects the cure. This is aptly illustrated by the following instance. A woman, suffering much discomfort and anxiety regarded as due to pelvic lesions, had these repaired by a capable surgeon who assured her that she should be now quite relieved and there was no occasion for worry But she felt no better, in fact grew worse until she fell in with one of the cults who assured her she would get well under her treatment and she did so very quickly. Had her physician recognized and treated the psychical trouble she probably would have recovered without operation although it also should have been done.

In the great war, the large number of cases of neuroses caused by mental, emotional and physical shock and overstrain and the horror through which the soldiers had passed, forced on the medical staff the necessity of the study of these cases

*An abstract of addresses given in Winnipeg, Edmonton, Calgary and Vancouver during the last summer.

and with phenomenal results. Reassuring suggestion played the greatest part in the recoveries. Naturally this has given an impetus to the study of like cases in civil life. In the latter, the onset of symptoms is seldom sudden as severe shocks are rare; usually its beginning is inappreciable and its course slow, and the cause maybe discoverable only by patient investigation. Most of the cases owe their origin to long continued unhappiness, fears, anxiety, worry and overwork with their physical effects; of these probably the first named is the most frequent and potent cause. It is necessary, therefore, to be alive to the fact that psychical disturbances may be the sole cause of the ill-health and at the same time give rise to marked symptoms associated with one or more organs. Also that in all chronic diseases especially, the symptoms are always increased. often seriously, by the patient's fears and anxiety.

That there is neglect of due attention to the emotional disturbances of people all who consider it will agree. The cause of this neglect lies chiefly at the door of medical education. Clinical training in the hospitals has dealt almost exclusively with physical ailments, the emphasis being laid on physical examinations with history relegated to a second place, and worse still, in a resort to the laboratory, especially the x-ray examination, before a full history is obtained and a proper physical examination made. Sound training requires that the greatest importance be placed on the patient's history and it should include the mental and psychical as well as the physical. If this were done, few physicians would ignore the emotions or feelings of the patient to the detriment of the patient's well being as well as the physician's prestige.

This widespread neglect by the profession not only injures its reputation and causes material loss, but forms the very basis for the birth and growth of the various cults that infest the land. The chief, if not the sole, cause of their existence is the failure of the profession to meet fully the psychical as well as the physical needs of the public. It is on the emotional ills of people that the cults live and flourish. They appeal to the psychical nature without knowing it, through their various fads, whether "spinal adjustment" or other. That the cause they assign for the patient's trouble only exists in the adjuster's mind, or forms a cloak for ignorance, is of no moment; that it appeals to the patient suffices to make a psychical impression that gives confidence which may relieve anxiety, and recovery follows. Such cases are met with almost daily in the experience of every physician and can usually be recognized by a little careful inquiry. It is a mistake to regard these ailments as imaginary. Gastric pain due to a psychical cause is just as real as a pain due to ulcer, and in the patient's opinion its relief is just as imperative. The object of our existence as a profession is to lead the way in prevention of diseases, to cure patients when possible and to relieve when this cannot be done. Our contract with our patients is to cure them and in this effort we are under obligation to use any and all means to attain that object whether the illness is physical, mental or emotional, or all of them. If we fail to use the means necessary for relief they will go elsewhere in the hope of getting it, and that hope in itself is often half the cure.

The most difficult are those with no local discomfort to indicate a probable cause of the psychical trouble. The cause has to be ferreted out and this can be done only by securing the confidence and cooperation of the patient, a difficult problem in not a few. It was in such war cases that loss of memory, speech, hearing etc. developed, and, worse still, the depressed and those showing psychical aberrations; in many of these cases the psychical balance was unstable and some were probably more or less affected before the war. As soon as the physicians understood these cases and applied proper treatment, marvellous results followed. Patients in civil life are rarely so severe and dramatic as the war cases, yet their suffering is just as real and relief is just as urgent. The following is a good illustration: a woman with persistent epigastric pain, due, she was told, to ulcer, was anxious to be relieved quickly as she had arranged to go on a European tour in a couple of weeks. Even water caused pain, sufficient of itself to prove that it was not due to ulcer. After careful examination she was assured that she could go if she obyed instructions; this she agreed to with alacrity. She was placed under good nursing care, told to ignore her gastric pain, to eat what was set before her and, as she was constipated, to go to the toilet precisely half an hour after breakfast, forgetting the constipation. The result was that she took full meals daily without discomfort and the bowels moved freely. She gained a pound a day, went to Europe and on her return told her nurses that she was quite well. Her great anxiety to be relieved formed conditions ideal for the success of psychical treatment.

Another case is that of a young woman of high colour and apparently well-nourished; that is, fat enough. Her sister had chronic tuberculosis and she was in dail y fear of becoming in-

fected. Haemoglobin was low and strength poor. She had been given Zambilletti's fluid hypodermically for some time, the blood improving, but it had become low again. Her diet was composed almost wholly of carbohydrates. With properly apportioned diet, increasing outdoor exercises as she grew stronger, and assurance that there was no danger of infection if proper care were taken, she was soon quite well. Zambelletti's fluid is good, but proper food is better, neither would have succeeded without the psychical change.

Of the diseases in which psychical symptoms always co-exist, one of the most important is exophthalmic goitre. The psychical disturbance probably always precedes, and is always present at the onset of the attack. Of the exact pathological condition there is still doubt. As the psychical symptoms usually precede and are always present in the disease, and in an increasing degree as the attack grows worse, it is justifiable to regard the psychical condition as a contributing, if not the chief cause of the disease. That it should be so regarded is further supported by the fact that many, if not most cases will recover under judicious treatment. To carry this out, isolation under proper conditions to afford psychical and physical rest, capable nursing, good food, and close encouraging medical attendance is essential. If this course is carried out efficiently it is probable that few would require surgical aid. The disease is evidently a nervous one with marked functional disturbance hence the imperative necessity of physical and emotional rest and encouraging suggestion.

"Nervous breakdown" is a very common complaint; and many take a real pride in telling that they have had it, especially if there have been several attacks. They roll the term "under their tongues like a sweet morsel." I often feel it a misfortune that the term was ever coined. In this condition, the emotional element has a large part if it is not the sole cause. In cases in which recurrence of the attacks takes place the emotional balance has been only improved, not restored in the intervals of apparent recovery. In such, a painstaking search should be made of the history for its unhappiness, worries, anxieties and disappointments; some one or more of them will be found. To effect a cure they must be removed; if that is impossible, the circumstances must be faced with renewed courage so as to be patiently endured, if they cannot be ignored.

The following case seen many years ago is interesting. A young married woman had been in bed for a year without any cause to be found for her invalidism. Her best dressing gown was placed on a chair beside her bed and she was asked to put it on and sit in this while we were downstairs for further consultation. On returning, she was sitting dressed in the gown. It was then suggested that she drive down to the shopping district to see the people. This she did. After that she resumed her usual life of activity.

In all acute diseases, pneumonia, typhoid, sepsis, etc., the emotions have their part. The people reported as "making a brave fight," are those whose emotions are under good control and do not therefore lessen the physical resistance. The man who can calmly face the gravest possibilities conserves his resources to the utmost. It is the surgeon's as the physician's duty to aid in preserving the emotional calm.

We all have known physicians of little knowledge and training who have been successful practitioners because of their optimism and readiness in assuring patients of their recovery, in this manner impressing the patient's psychical condition by raising hope and restoring courage. They have often been the most honest and genial of men. It is necessary to remember that a vast number of the milder ailments, with as well as without local physical symptoms, will recover in a shorter or longer time even without treatment. The psychical nearly always plays a major role. It is from this class, especially the rich, that the cults largely draw their patronage and their sustenance. They will continue to do so as long as physicians fail to recognize their psychical troubles and do not adopt proper means for their relief.

The contrary aspect of the matter merits comment in closing. In any serious disease the psychical symptoms may be so marked as to overshadow those of serious physical disease. This is especially true of tumour of the brain, circulatory diseases, renal disease with uraemia, etc. Each and all of them may have the emotional symptoms so marked as even to mislead the most expert. This is usually due to imperfect examination made often in conditions rendering a more perfect one impossible. Under such circumstances a diagnosis should await the opportunity of a full examination.

The object borne in mind in these addresses was to press on the family physicians throughout Canada, the most important and deserving body in the profession, the need of attention to this much neglected field, but it is hoped that specialists in general, including surgeons, will give consideration to this important matter.

ACHES AND PAINS OF RENAL ORIGIN*

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EVERY practitioner is confronted from time to time with the problem of aches and pains which raise a suspicion of some disorder of the kidney, and my intention in this address is to record my own difficulties in diagnosis, and the methods adopted to surmount them. I have gone carefully through the records of upwards of 1,500 successive cases of cystoscopy of which I have notes, and picked out those in which pain was complained of, with a view to ascertain whether the condition of the kidney or ureter or the site of the lesion could be correlated with pain of a particular type or distribution. The results of these observations show, on the one hand, that the most extensive disease of the kidney may exist without any pain whatever, and, on the other, that a very slight departure from the normal may be associated with almost unbearable agony; also that a precisely similar condition may, in one patient, give rise to the merest local discomfort, and in another to pain of a severe character, radiating to the utmost terminations of the peripheral nerves. I have in my mind at the moment a man who used to bring in a small bottle a number of small calculi passed with the minimum of discomfort. Any one of these small calculi would be capable in another patient of producing the most intense renal colic.

Papin and Ambard in a recent article ("Etude sur l'Enervation des Reins," published in "Archives des Maladies des Reins et des Organes Génitaux-Urinaires," Tome I, No. I, Paris, 1st April, 1922) give some interesting facts bearing on renal pain and its treatment, which will be referred to later.

It will be convenient at this stage to review briefly the nerve supply of the kidney and its pelvis. The kidney receives its chief nerve supply through the renal plexus which accompanies the great vessels into the hilum. Branches also accompany the vessels to the capsule and accessory vessels, when the latter exist. The renal plexus comes off from the solar plexus, which is composed of a network of nerves and ganglia lying between the terminations of the great splanchnics of either side. The great splanchnic is formed by branches coming from the 6th to 10th thoracic ganglia, receiving filaments (according to Beck) from all the thoracic ganglia above the 6th. It terminates in the semilunar ganglion, which also received the pneumo-gastric and filaments from the phrenic. The small splanchnic, which is sometimes double, is formed by filaments from the 10th, 11th, and 12th ganglia and terminates either in the semilunar ganglion or passes directly into the renal plexus. The renal plexus is formed from branches issuing from the semilunar ganglia, the small splanchnics, and sometimes from the great splanchnics; it also receives a branch from the first lumbar ganglion. The plexus is composed of filaments and ganglia. The filaments follow the course of the vessels, around which they form a close network. In the kidney itself the nerves follow the blood vessels as far as their most remote terminations, and have been traced to the vascular tuft of the glomerulus. Other branches are distributed to the uriniferous tubules. Sensitive end organs have also been described in the muscular walls of the pelvis and calices, in the tunica adventitia and tunica media of the vessels, and in the capsule of the kidney. The nerves to the kidney itself are, with few exceptions, non-medullated, while those distributed to the pelvis and calices are for the most part medullated. The cells met with in the ganglia of the renal plexus are of the sympathetic type. It appears probable that renal pain proceeds from the sympathetic. According to Wundt the cells of the sympathetic oppose an obstacle to impressions, only overcome when these are of a violent nature. It is held by many authorities that painful sensations in the sympathetic system are really only perceived on quitting that system and gaining, by way of the rami communicantes, the posterior roots of the cord, and, through these, the cerebro-spinal centres. The result of this is that pain is often reflected along the course of nerves connected with the corresponding rami communicantes. Section of the spinal cord be-

*Read before the Academy of Medicine, Toronto, October 12th, 1922

tween the 8th and 9th dorsal segments abolishes the sensibility of the kidney and ureter. Section of both splanchnics does not abolish the sensibility of either kidney or ureter. The pneumogastric takes no part in the conduction of renal pain.

We are now in a position to refer to the question of how far the kidney, pelvis and ureter are sensitive to various stimuli. Pressure on the normal kidney produces pain of a sickening character somewhat similar to, but much less severe than that produced by pressure on the testis or ovary. When an operation is performed on the kidney under local anaesthesia manipulation of the organ produces pain. The sensitiveness of the kidney to heat and cold has not been fully investigated, but would appear to be slight. Puncture and section of the kidney are apparently not specially painful. Manipulations, however, carried out on the pedicle, and, especially, stripping back of the peritoneum, are attended with pain. Compared with the kidney the pelvis and ureter are highly sensitive. The patient is often cognisant of the presence of the ureteral catheter in the pelvis of the kidney, and if the former is pushed too far pain may be produced. Hot and cold fluids introduced through the ureteral catheter are not clearly perceived as such. Distension of the pelvis, however, is very definitely painful. If more than 3 to 7 c.c. of fluid are injected into a normal pelvis, pain resembling renal colic is, as a rule, provoked, and may at once be relieved by draining off the fluid injected. Pyelic pain may be very accurately studied by pyelography, or by simply measuring the capacity of the pelvis by the injection of fluid. The pain produced by distension of the pelvis commences in the subcostal region in the anterior axillary line. Tender points can be demonstrated by touch in the costo-lumbar, sub-costal, paraumbilical and iliac regions. These areas are those to which pain is referred by the cerebro-spinal nerves from impressions received by the sympathetic. Pain may be referred along the course of the nerves of the lumbar plexus towards the thigh, the testicle or the labia majora, or it may be referred to the epigastrium or the renal region of the opposite side. Zones of cutaneous hyperaesthesia may be demonstrated by stroking or pinching the skin. The tenth, eleventh and twelfth dorsal segments correspond in part to the kidney: the eleventh, twelfth dorsal, and first lumbar correspond to the pelvis and ureter. Certain reflex phenomena such as nausea, vomiting, and pallor, with cold sweats, unassociated with disturbance of pulse or respiration, commonly accompany pyelic pain. In pathological conditions the sensitiveness of the kidney and ureter may be profoundly altered. Papin and Ambard* classify renal and pyelic pain as follows:

1. That due to mechanical or traumatic causes.

2. That due to inflammatory conditions.

The mechanical causes are:

(a) Distension of the ureter, pelvis and calices.

(b) Distension of the parenchyma in the capsule by congestion or oedema of the kidney.

(c) Contact of a foreign body with the walls of the pelvis or calices.

(d) Dragging of the pedicle of the kidney.

(e) Compression of nerves. Most of the pain is, however, reflex or of a toxic nature.

(f) Sclerosis of the kidney.

The inflammatory causes are:

(a) Lesions of the pelvis and calices, such as pyonephrosis.

(b) Lesions of the parenchyma, such as pyelonephritis.

(c) Lesions of the perirenal cellular tissue, such as perinephritis and perinephritic abscess.

These authors are of opinion that renal pain is usually, as a matter of fact, pyelic. In calculus, hydronephrosis, movable kidney, renal tuberculosis, cancer and renal haematuria, obstruction of the ureter declares itself by renal colic due to distension of the pelvis.

Pain in the kidney itself is generally of moderate intensity except in inflammatory lesions when it may become very severe.

It is very instructive, when one is constantly seeing cases of urinary disease, to record in the patient's own words his description of the pain he suffers. A collection of such accounts is of great interest, especially if the case is followed to its termination by operation, or in the post mortem room. A study on these lines shows that the most varied pathological conditions may give rise to almost identical symptoms. This supports the suggestion that a common cause may be present in all, namely, distension of the renal pelvis from some obstruction. This obstruction may be a calculus, a kink, a thickened ureter, or a blood clot. Except when obstruction is present, there does not appear to be any positive pressure in the pelvis. A proof of this is that

Loc. cit.

when for any reason an incision is made into the pelvis of the kidney—say, for the removal of a stone—close, accurate, watertight suturing is not absolutely necessary to prevent leakage. The urine seems to trickle down the walls of the pelvis, as rain down the roof of a house, and, if no obstruction is present, finds its way into the upper part of the ureter, where peristalsis begins and forces it towards the bladder. If the obstruction has not been relieved, leakage will take place. It is reasonable to suppose that the peristaltic movements of the ureter, if excessive, may be painful, just as those of the bile ducts and intestinal tube may be. Efforts by the ureter to pass on a calculus or to overcome an obstruction are probably attended with pain, but an investigation of cases with the most intense renal colic radiating even to the toes, shows that the obstruction is quite frequently at the ureteropelvic junction, hardly, if at all, involving the ureter. It is, of course, possible that spasm, started in the pelvis, may be transmitted along the ureter, and one does observe movements at the ureteral orifice in certain cases in which there is no efflux.

Renal pain or pyelic pain may be so slight as to pass almost unnoticed, or it may be of the most violent character. It may remain in one spot, or it may radiate widely. It may start suddenly or gradually, and may terminate in the same way. It may only last for a few seconds, or it may continue for hours. It may occur in attacks, with intervals of complete or comparative freedom, or it may be more or less constant. It may come on during exercise, or when the patient is resting quietly in bed. It is variously described as a sense of discomfort, an ache, a gnawing or burning sensation, a bursting feeling, or a feeling of fulness, a stab, a tearing or cutting sensation. The intensity of the pain is no index whatever of the severity of the lesion. A minute calculus may produce the most severe agony, whilst one the size of a chestnut may give very little indication of its presence. A very slight kink of the ureter may produce more pain than an extensive hydronephrosis.

The direction of the radiation of the pain is, as a rule, towards the lower extremity, generally to the groin, the testis or labia majora, sometimes into the upper part of the thigh, more rarely to the knee and the leg, even as far as the toes. Occasionally, however, radiation takes place towards the upper extremity, to the shoulder, arm and fingers. Not infrequently the pain radiates to the opposite renal region, and occasionally is felt solely on the presumably healthy side. Reference has already been made to reflex nausea, vomiting, pallor and cold sweats. A special variety of pain is that seen in some cases of movable kidney, and called Dietl's crises. The pain in these cases may be due to torsion of the pedicle, kinking of the ureter, or dragging upon the pylorus, gall-bladder or other abdominal structure. It may be suggestive of an acute abdomen with rigidity, or may be of the type already referred to in discussing distension of the renal pelvis.

A typical attack of renal colic is so characteristic that a diagnosis of something pathological in the kidney or ureter is justified, and yet the surgeon will occasionally encounter cases in which every examination that can be made fails to establish a diagnosis, and one is driven to enquire whether extra-renal conditions may not in exceptional cases give rise to colic that is with difficulty distinguished from that due to renal causes. It is important to ascertain if the site of the pain or areas of hyperaesthesia, lumbar, subcostal, paraumbilical, iliac, etc., give any clue to the position of the causative factor. My own observations lead me to the conclusion that it is unsafe to predict from these symptoms alone the situation of the lesion. In back pressure from an enlarged prostate, for instance, pain is often complained of in the lumbar region. Pain in the iliac region may indicate the presence of a stone in the lower ureter, but is quite often present with a stone in the pelvis of the kidney. When the lesion is near the vesical end of the ureter (e.g. a calculus) frequency of micturition is often complained of, but this symptom may be entirely absent under these circumstances, and be present when a calculus is lodged in the renal pelvis. Pain of renal origin must be looked upon in many cases as referred pain, and its distribution as not necessarily giving any clue to the location of the lesion in the urinary tract.

Methods of Investigation.—Abdominal examination may discover displacements, deformities or enlargements of the kidney, swellings in the renal region, tenderness, rigidity, or areas of hyperaesthesia. Rectal and vaginal examination may detect a calculus in the lower end of the ureter, thickening of the latter, undue tenderness or other abnormality. Examination of the spermatic cord may disclose the presence of a varicocele, suggesting renal tumour if on the right side. The urine will, of course, be carefully investi-

gated by chemical, microscopical and bacteriological tests. The absence of any demonstrable departure from the normal, however, does not by any means exclude the kidney. A small aseptic stone may be present without giving rise to any abnormal constituent such as blood, pus, or albumin. In certain cases of hydronephrosis the urine may be normal to the usual tests, and in pyonephrosis the affected ureter may be blocked at the time of examination. A tumour of the kidney may be present without showing any abnormality of the urine. X-ray examination, if thorough and efficient, will demonstrate alterations in the position, shape and size of the kidney, besides showing the presence of opacities. Cystoscopy may demonstrate alterations in the shape, size and surroundings of the ureteral orifice, and changes in the rate, rhythm and character of the efflux. Ureteral catheterisation will show the character of the urine from each side, and any alteration of the relative specific gravities. The latter test, which I will call the specific gravity test, has been of great service to me for diagnostic purposes. Shortly stated, I find that with unilateral disorders of the kidney the specific gravity on the affected side is diminished in a large proportion of cases. If there is a difference in specific gravity on the two sides, even if no other sign is present, the chances are that the kidney which secretes the urine of lower specific gravity is pathological. A low specific gravity does not necessarily mean a seriously damaged kidney. It may be due to reflex diuresis from a small fragment of stone or from early disease. On removal of the cause (if removable) the specific gravity returns rapidly to normal.

Combined with ureteral catheterisation, the subcutaneous, intramuscular or intravenous injection of dyes such as indigo carmine or phenol sulphone phthalein may give valuable information. The time of the appearance of these dyes in the urine, the amount present in the specimens collected by ureteral catheter, and the time taken for their elimination will assist in clearing up many doubtful cases. The ureteral catheter will further demonstrate patency or narrowing of the ureter, and, by injection of fluid, the capacity of the renal pelvis. By the opaque catheter or bougie, opacities discovered by radiography may be accurately located, and, if stereoscopic radiograms are employed, their position relative to the ureter and kidney accurately defined.

Finally, by pyelography the shape and size of the pelvis and calices, the presence and relations of foreign bodies, and the position, direction and calibre of the ureter may be demonstrated with the greatest accuracy. I now use almost exclusively bromide of sodium solution for this purpose. This is run in through the ureteral catheter into the pelvis of the kidney until the patient complains of slight discomfort. A radiogram is then taken which shows with great accuracy the shadow of the pelvis and ureter.

Should these methods fail to establish a diagnosis, or for any reason be unavailable, and the surgeon be in doubt between a renal and an abdominal lesion, it may be necessary to explore. For this purpose I have in a few cases employed an oblique abdominal incision extending from the mid-axillary line just below the costal margin to the iliac region parallel to the fibres of the external oblique. The anterior part of the incision opens the peritoneal cavity, and the posterior part allows of the retroperitoneal exploration of the kidney and ureter. In this way the appendix, caecum, colon, liver, gall-bladder, spleen, stomach, duodenum, tubes, ovaries, and uterus, as well as the kidney, may be explored with relatively little trauma to the abdominal wall. The possibility of disease of the spinal column or cord should always be borne in mind. Spinal caries, aneurysm of the aorta involving the vertebrae, tumours involving the spinal column or cord, and locomotor ataxia may give rise to pain closely simulating renal colic.

It now remains to mention some types of renal disorder commonly met with in practice which are attended with pain. Pain due to accompanying bladder conditions will not be discussed.

Renal Calculus.—Undoubtedly the most frequent cause of renal pain and renal colic in its worst form is renal calculus. Looking over the notes of seventy-two consecutive cases I find that pain was present at some time or another in all but two. The pain was of the most varied character. In one it was very indefinite on the affected, and also was present on the sound side. A large phosphatic stone weighing one and one-half ounces was removed from the pelvis of the right kidney. In another the pain was so slight that the patient, a young woman, was treated for fifteen years for Bright's disease. This was "cured" by the removal of an oxalate of calcium stone from the pelvis of a movable right kidney. On the other hand, a patient with a small phosphatic stone the size of a pea lodged in the pelvis of the left kidney, complained of "frightful" pain radiating to the groin and knee,

associated with vomiting and rigors. The patient actually "yelled" with the pain in the knee. The radiation of the pain in these calculus cases varied greatly. Most usually it radiated towards the groin, testis, or labia majora, frequently over the buttock, or down the inner or outer side of the thigh, sometimes into the penis, sometimes down the leg as far as the heel or toes, and occasionally all over the abdomen. In one case it started in the left renal region, radiated right up the back to the shoulder and back of the head. The patient was relieved by the passage of a small stone. A patient in whom a small stone about the size of a melon seed was removed from the right ureter near the bladder. behaved like a regular madman during attacks of pain which, starting in the kidney, radiated to the testis. Another patient complained of cramplike pain in the lower abdomen, and passed some small, irregular calculi about the size of split peas. Another felt "something snap in the kidney." A calculus was subsequently removed from the renal pelvis on the affected side. In a patient with calculi in both kidneys the pain was now on one side and now on the other, and radiated on both sides into the leg. The following rather rare case is worth recording. The patient, a woman, suffered severe renal colic from the passage of a gummy material containing the characteristic spherules of calcium carbonate. The pain first affected the left side and radiated into the leg. There was rigidity and tenderness in the left loin. The urine contained a copious deposit of white material, thought to be pus,but which proved on microscopical examination to be an almost pure deposit of calcium carbonate. X-ray examination was negative. A few days later the patient took a severe pain in the opposite kidney, again with the discharge of calcium carbonate. Reduction of the calcium content in the diet effected a speedy cure.

Similarly one sees occasionally cases of renal pain due to the passage of crystals of oxalate of calcium, and probably other insoluble salts in the urine may cause pain.

In many of these cases of renal calculus frequency of micturition, especially during the attacks of pain, was complained of. This was apart from any associated cystitis or other bladder affection. Reflex vomiting, pallor and cold sweats were exceedingly common in the severe attacks.

Tuberculous Kidney.—It must be emphasized that renal pain is not a cardinal symptom of tuberculous kidney. Looking over the notes of 117 consecutive cases I find that pain was complained of in fifty-six cases only, that is, in less than half the number. Even in advanced cases pain may be entirely absent. In most of the painless cases there was thickening of the ureter, and, in many, very extensive destruction of the kidney substance. In one case, though the pelvis was enormously dilated and the ureter resembled a piece of small intestine, pain was not complained of. Even with a large perirenal abscess pain may be absent. In the painful cases the symptoms resembled those occurring in renal calculus but were rarely so severe. It was described as an ache, or a soreness more or less constantly present, or a feeling of fulness on the affected side. Attacks of renal colic were, however, not uncommonly met with, but these rarely attained the intensity of those due to calculus. A few patients stated that the pain started in the bladder and radiated up into the kidney on the affected side. Some complained of "soreness" in both kidneys, and in a few the pain was on the side opposite to the seat of disease. Radiation of the pain was somewhat similar to that found in calculus. In one case the pain radiated to the shoulder on the affected side. Vomiting and pallor with sweats were less frequent than in the case of stone.

The pain in tuberculous kidney is probably due to intra-pelvic pressure, but the chronicity of the disease allows of more gradual distension than in the case of stone. At times, however, the passage of thick pus or debris down the ureter may suddenly increase the pressure in the pelvis and give rise to colic. The thickened, rigid ureter, so frequently present, is hardly capable of spasm.

Pyelitis.—Pain is a very frequent symptom in pyelitis. Thus out of seventy-five cases which I have noted pain was present in fifty-nine or almost eighty per cent. In the acute cases with rigors and fever, vomiting, pain and tenderness, with, perhaps, palpable swelling of the affected organ, and muscular rigidity were commonly present. The pain was more fixed and constant than in calculus and tuberculosis and was not generally so severe as in calculus. Even in acute cases, however, pain may be entirely absent. In chronic cases pain is often absent, and the affected kidney is only discovered by cystoscopy or ureteral catheterisation. In one case in which inspissated pus was squeezed out from the ureter, no pain was complained of. In a few cases renal colic was present, the pain

radiating to the groin, testis, or even to the leg or foot, but the type was generally much less severe than that seen in calculus. The following case in which the kidney was explored, is a good example of acute unilateral pyelitis. A married woman, aged thirty-two, had repeated rigors, with fever, sweating, rigidity and acute pain in the right lumbar region. The right kidney was tender and painful. Bacillus coli communis was found in the urine. On exploration the kidney was congested and enlarged and the pelvis was dilated. The local pain and tenderness in these cases are probably due to swelling of the parenchyma of the kidney and distension of its capsule. When colic is present it is no doubt due to the passage of purulent coagula along the ureter.

Hydronephrosis and Pyonephrosis.—In hydronephrosis we have the conditions most favourable to the development of renal colic, *viz.*, obstruction and distension of the renal pelvis. As might be expected, therefore, pain is a frequent symptom in these affections. Out of thirty-seven cases examined, pain was present in thirty-one, and doubtful in two. The pain, like that due to calculus and tuberculosis, varied very much in character and distribution. A very frequent history was that of pain, and a tumour in the side associated, perhaps, with vomiting. It is noteworthy that the radiation of the pain resembled very closely that seen in renal calculus. Now, in a large proportion of the cases the block was present at the uretero-pelvic junction and did not involve the ureter itself, yet the pain was very similar to that said to be due to the passage of a calculus along the ureter, and attributed to spasm of the latter. Some of the cases of hydronephrosis were associated with an abnormal renal artery running to the lower pole and crossing the ureter. Hurry Fenwick attributed the pain in these cases to spasm produced by the artery acting as a bowstring to the ureter. This spasm might itself cause pain or, by narrowing the ureter, produce intrapelvic pressure which, as we have tried to show, is the main cause of renal colic. A curious circumstance is that in some of these cases of hydronephrosis the pain is of recent onset though the state of the kidney found at operation justifies the assumption that the condition has been present for years. The patient may have been perfectly free from pain from his youth until suddenly he is seized with violent colic. Operation reveals a kidney reduced to a shell. Why then has pain not been present before? An explanation that suggests itself is that while very gradual distension spread over perhaps a number of years may be painless, a time comes when the uretero-pelvic junction becomes sufficiently kinked from the disturbed relations of the parts, caused by dilation of the pelvis, to cause a more or less complete block. Pain is then felt and is only relieved by the release of fluid from the dilated pelvis. In some cases hydronephrosis or pyonephrosis is accidentally discovered by palpation of the abdomen and in others again there is a history of attacks of pain extending over twenty years or more.

The pain in certain cases of hydronephrosis and pyonephrosis may rival in severity that found in renal calculus, as in the following: A man, previously healthy, began, at the age of twenty-three, to suffer from paroxysms of renal colic. Before admission to hospital he had had three attacks at five months intervals. The pain started in the left lumbar region and radiated towards the iliac fossa. During the attacks the patient became weak and vomited. The urine was clear amber, acid, sp. gr. 1020, free from albumin, blood, pus and micro-organisms. There was some tenderness in the left lumbar region but the kidney could not be palpated. X-ray examination was negative. Here we have a patient with typical attacks of severe renal colic with no definite physical signs, and with normal urine, a state of affairs occasionally seen and practically always attributed to stone. Cystoscopic examination showed no change in the bladder or ureteral orifices. Catheters were introduced into each ureter, but no flow could be obtained on the affected side until the catheter had been passed as far as the renal pelvis. Then a large quantity of fluid was obtained. The specific gravity of this specimen was 1005 as against 1025 on the sound side. Sodium bromide solution, a large quantity of which was accommodated without pain, was run into the renal pelvis on the affected side. Radiography demonstrated great dilatation of pelvis and calices, and operation revealed a large hydronephrosis.

Renal Tumours.—Pain may be entirely absent in cases of renal tumour. It was present in eleven out of eighteen cases recently examined, *i.e.*, in about sixty per cent. It was described as a soreness, a dragging pain, pain and tenderness, or severe renal colic. In one case the patient had what was described as "terrible" pain radiating down the leg and accompanied

by vomiting and the passage of clots. In another case in which there was no visible blood in the urine, the patient complained of pain radiating to the outer side of the ankle. The tumour proved to be a malignant adenoma.

There are various factors which may contribute to the production of symptoms in renal tumours. The tumour may drag on, or involve, adjacent structures: by distension of the renal capsule it may cause pain; the pelvis may be partially or wholly filled with growth; the veins may be blocked with it; blood clot may be present and give rise to acute renal colic during its passage down the ureter, or detached portions of growth may act in the same way. Most of my cases who had pain suffered from renal colic of various degrees of intensity, and in most of them the cause appeared to be blood clot in the pelvis or ureter.

Haematuria.—In some cases of haematuria the blood is poured out in such small quantity that time is allowed for intimate admixture with the urine, and pain may be absent. In others the bleeding is so profuse that clotting does not take place until the blood reaches the bladder. In others again clotting takes place in the pelvis or ureter, and produces the wellknown symptoms of renal colic. After the passage of the ureteral catheter, when blood is drawn, it is not uncommon for acute pain to occur. No doubt in such cases the mucous membrane of the ureter is rendered more irritable by the trauma inflicted. Sometimes this pain closely simulates that produced by renal calculus. The amount of blood drawn does not seem sufficient of itself to account for it. That idiosyncracy plays a part is shown by the fact that in some patients the smallest clot may produce very severe symptoms while in others no discomfort is felt. This holds good in all forms of renal disorder in which pain is a common symptom.

Movable Kidney.—Pain is often present in cases of movable kidney, but this condition is so commonly associated with other manifestations of visceroptosis that it is difficult sometimes to apportion the blame between the various organs concerned. On the right side especially it may be impossible to differentiate symptoms of appendicitis, mobile caecum, and other abdominal affections from those due to displacements of the kidney, and mistakes in diagnosis are often made. In such cases I have found ureteral catheterisation and pyelography useful. Most usually, if any difference is seen in the specimens from the two sides it is a diminished specific gravity on the affected side, due, no doubt, to a reflex unilateral diuresis. Rarely, the specific gravity is raised on the affected side, due, perhaps, to delay and increased absorption of fluid from slight kinking of the ureter. Pyelography may show some alteration in the pelvis or change in the calibre or direction of the ureter. The following case is a good illustration. A man, aged twenty-seven, previously healthy, took a sudden severe pain in the left lumbar region, radiating to the groin and testicle. He also felt sick and vomited, and complained of a constant desire to micturate, passing only a few drops at a time. He had several similar attacks. The urine was free from albumin and pus but contained a few red blood cells. The specific gravity of the specimen on the affected side was 1005 as against 1015 on the sound side. Pyelography showed a sigmoid bend on the ureter just below the renal pelvis on the affected side. No calculus was seen but the kidney was tilted and lower in position than normal. Nephropexy straightened out the ureter, fixed the kidney in its normal position and cured the patient.

Other Causes of Renal Pain.—One must always bear in mind that renal pain may be due to some condition of bladder or urethra. Carcinoma of the bladder, a papilloma at a ureteral orifice, an enlarged prostate or stricture of the urethra may cause renal pain on one or both sides from back pressure. Besides these there are some rarer conditions occasionally met with which are accompanied with renal or pyelic pain. Such are certain forms of chronic nephritis, infarcts, hydatid cyst in which small cysts are sometimes passed, giving rise to attacks of renal colic, other cysts of the kidney, and horseshoe kidney.

As a confession of failure, due no doubt to faulty methods in the past, I am bound to admit that I have only too frequently seen cases of renal colic in which I have been unable to trace the cause.

In some of these the urine has been perfectly normal, and x-ray examination negative. In a certain number the only indication of a renal origin has been a diminished specific gravity on the affected side. This may have been due to a small undetected calculus, a narrowing or kinking of the ureter, an accessory renal artery, or some other obscure condition which reflexly alters the blood supply of the organ. In other cases every method of diagnosis has been tried, with the sole result of excluding gross lesions.

Recent advances in our methods of examination will reduce the number of undiagnosed cases and add to the satisfaction of all concerned in the investigation and treatment of these elusive complaints.

Treatment.—Cases of renal pain will be dealt with, of course, by removal of the cause, when this is possible. Papin and Ambard* point out, however, that in certain cases of painful nephritis, small hydronephroses and renal neuralgias of ill-defined character the only treatment which up to the present has been applied has been either insufficient or excessive. While decapsulation, temporary nephrotomy, and nephropexy are insufficient to effect a cure in a large proportion of cases of this sort, removal of the kidney is too drastic a step. Under these circumstances they have devised an operation which relieves the pain and yet conserves the kidney. This consists in resection of the nerves of the kidney. The pedicle is carefully exposed, the nerve filaments accompanying the vessels are defined, seized one by one with dissecting forceps and torn across by slipping under each a probe-pointed director. The authors state that it is not difficult to distinguish the resistant nerves from the softer lymphatics. Before the operation can be considered complete the vessels should have been stripped of all the nerve filaments surrounding them. In order to expose certain of the fibres it is necessary to pass between the different branches of the vessels. The renal vein is in danger of being torn unless care is taken. Should this accident happen, a delicate suture should be used to close the opening. In all cases the kidney is fixed in position by flaps of capsule, and a small drain is placed at the lower end of the wound. The authors publish detailed accounts of six cases so treated, with complete relief in five. After this operation the patient suffers much more than after any ordinary operation on the kidney, even nephrectomy. There is, however, no urinary trouble, neither polyuria nor marked oliguria. Things are just as they are after any operation outside the urinary tract. In these patients, specimens of urine taken from the enervated kidney differed little from those collected from its fellow of the opposite side.

In conclusion, it is apparent that the idea running through this address is that the pain we have been discussing is due in a large proportion of cases to distension of the renal pelvis.

Treatment should be directed towards removing the cause, and involves, in some instances, ablation of the kidney. In selected cases it may be possible to relieve the patient by interrupting the nerves carrying the painful impressions.

Loc. cit.

A STUDY OF ONE HUNDRED CASES OF CHOREA WITH PARTICULAR REFERENCES TO THE CARDIAC COMPLICATIONS*

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THE purpose of this study is to review a series of cases of chorea with the idea of determining the incidence of cardiac disease in uncomplicated cases and to see what influence the added occurrence of rheumatic fever and other factors may have on the frequency of cardiac involvement. For this one hundred consecutive cases of typical chorea were selected. These patients were treated on the wards of the Peter Bent Brigham Hospital during the years 1913-1921, inclusive. In every case special inquiry had been made into the personal history with regard to the occurrence of acute rheumatic fever. On discharge every patient was carefully examined to determine just what damage had been done to the heart. A diagnosis of organic cardiac disease was only made after a thorough consideration of all the factors. It is safe to assume therefore, that the diagnosis in these cases represents a fairly accurate approximation of the incidence of cardiac disease. It is recog-

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nised, of course, that in certain patients further evidence of cardiac damage may develop in the future. This applies particularly to the development of mitral stenosis, for I am of the opinion that mitral stenosis can develop insidiously without any further acute infection, while the signs of aortic insufficiency usually appear during or immediately after the acute process.

General Etiological Considerations

This group of cases conformed as to sex and age with the generally accepted notions in this regard. There were sixty-six females and thirty-four males, a ratio of two to one. The average age was 13.3 years, the oldest patient being twenty-three and the youngest four years old. The predominance of females is striking when compared with a series of 190 cases of acute rheumatic fever that was similarly studied, in which the ratio of females to males was nearly one to two, *i.e.*, just the opposite to the proportion in chorea. If both chorea and acute rheumatic fever are evidences of a "rheumatic" infection why should girls be attacked by chorea so much more frequently than boys? It may be due to the fact that this "rheumatic infection" is apt to attack the most vulnerable part and that in a general way the most vulnerable part in boys is the joints and muscles, while in girls, particularly at this adolescent period, it is the nervous system.

In considering the etiology of chorea which is by no means settled, there are various factors that are of especial interest when compared with the findings of this study. The relation of heredity to chorea is slight. In this review there was a history of chorea in the immediate family in nine per cent. of the cases. This would seem to indicate not an actual transmission of chorea but the transmission from parents to children of a nervous system of increased vulnerability, or the transmission of an increased susceptibility to rheumatic infection. Poynton[1] says that the "undoubted hereditary tendency of rheumatism makes itself felt in the family history of chorea." There was a history of insanity in the father or mother in five per cent. of these patients. This fact may have some bearing on the importance of a weakened nervous system. It is furthermore impossible to judge what rôle the infectiousness of this disease has in attacking more than one member of the same family. Are they more exposed to the same bacterial cause?

Rheumatism has for some time been considered an important factor in the causation of chorea. Russell[2] in 1910 said, "there is abundant evidence that both diseases are microbic in origin and that the same micro-organism is responsible for the clinical manifestations of rheumatism and chorea." It is generally agreed that a certain number of cases of chorea have had acute rheumatic fever. This percentage varies considerably throughout the literature ranging from less than two per cent. to over eighty-five per cent. The wide variation is chiefly due to a difference in definition of the term "rheumatism." Koplik[3] says that rheumatism should include beside acute rheumatic fever, the common joint pains and growing pains which he regards in children as definitely rheumatic in origin. Other authors limit the term to clearly defined cases of acute rheumatic fever. As Mackintosh and Anderson[4] point out, if only the definitely diagnosed cases are included the percentage is too low and if all cases with a history of muscle or joint pains are included the percentage is too high. Thayer[5] in 789 cases found rheumatism in the past history in 21.6%. Osler[6] in a series of 554 patients found a history of acute rheumatic fever in eighty-eight or 15.8%. In an additional thirty-three cases there was a history of acute rheumatic pains. This brings the total to nearly twenty-two per cent. The Collective Investigation Committee[7] of the British Medical Association, in reporting a series of 439 patients with chorea, found 116 which gave a definite history of joint affection with fever, and twenty-six doubtful cases making a total of 142 patients or 32.5%. St. Lawrence[8] in an intensive study of sixty-five children under observation for an average period of four and one-half years, found forty-one cases of chorea, nine or 21.9% of which had acute rheumatic fever. In most instances where only the definitely diagnosed cases of acute rheumatic fever are included the percentage is surprisingly close to twenty per cent. In this series there was a history of definite acute rheumatic fever in twenty per cent. of the cases. In addition there were fourteen patients who gave a history of joint pains. This brings the total possible cases of preceding rheumatism up to thirty-four per cent. As a matter of fact probably both chorea and acute rheumatic fever are signs of the same infection, so that it is quite incorrect to speak of one as the cause of the other.

Other diseases that may be mentioned in relation to the cause of chorea are scarlet fever, ton-

sillitis and syphilis. Scarlet fever is claimed by some to be an important cause of chorea. If scarlet fever is regarded as another type of rheumatic fever, it may have the same relation to chorea that acute rheumatic fever has. Scarlet fever occurred in the past history in eighteen per cent. of these cases, but in only one instance did the attack of scarlet fever seem to bear any relation to the chorea. In this case the scarlet fever developed while the patient was under treatment for chorea. Tonsillitis, which also may be regarded as an evidence of "rheumatic" infection, and which is variously regarded by different writers in its relation to chorea, occurred in thirty-four per cent. of these cases. Many cases of tonsillitis particularly in children, are overlooked so that this factor may be more important than is generally believed. Milian[9] of Paris, found evidence of syphilis in seventy-five per cent. of his patients. This finding is not supported by more recent investigations. A positive blood Wassermann has been found in from four to seventeen per cent. of cases variously reported. Serological examination of the spinal fluid has been negative in all of a number of reported instances. In this series there was a positive blood Wassermann in 11.6% of the patients. As this is about the usual finding of positive Wassermann tests in our hospital cases[10] it seems unlikely that syphilis plays any rôle at all in the causation of chorea.

It is interesting to note that in four cases in this series there was an absolutely negative past history; *i.e.*, four children had been perfectly well before the attack of chorea. Two of these cases developed organic cardiac disease. In neither of these patients was there any joint or muscle pains either in the history or during the course of the chorea. Whereas there are many cases in which the cardiac damage was in my opinion due to the chorea, in these two patients with a history of no other infectious diseases we can feel sure that the chorea alone was responsible for the cardiac involvement. Some observers still question the part played by chorea in the production of heart disease. One difficulty in answering their contention has been in finding cases like these mentioned above in which chorea could be shown to be the only possible cause of the endocarditis. Fright or any strong emotion may act as the exciting cause of an attack of chorea. In this series there were eighteen cases in which the onset of the disease dated from some sudden fright. It is interesting that the report of the Collective Investigation Committee of the British Medical Association[7] gives twenty per cent. as the number of cases in which fright seemed to play a part. Fright is never the sole cause. Poynton[1] mentions the fact that there was no appreciable increase in the incidence of chorea in London during the air raids, when if fright alone were ever the cause it surely had every opportunity and should have been expected to operate.

Cardiac Complications.—The incidence of cardiac disease following chorea varies in the different series reported. This variation is due to several factors. Some authors have included only those cases in which the endocarditis developed during or immediately following the first attack of chorea, others have included cases who have had repeated attacks of chorea and rheumatic fever, while still others have reported cases examined from two to four and one-half years after the chorea. The accompanying table summarizes their reports.

TABLE I

Author	*Total number of cases*	*Percentage that developed cardiac disease*
Koplik (3).....	319	72
Fraser (11).....	300	63
Osler (6).....	140	51
St. Lawrence.....	41	39
Abt & Levinson (12)..	226	37
Branson (13).....	67	33
Collective Investigation Com. (7)...	439	31.4
Helmholtz (14).....	138	26
Thayer (5).....	689	25.4

From this table we see that in a total of 2,359 cases of chorea there was organic cardiac disease in 953 or 40.3%. This means that two-fifths of all cases with chorea will have organic heart disease. In our series of 100 cases there were forty-five instances with organic cardiac disease. It is interesting to compare in this connection the findings in the series of 190 cases of acute rheumatic fever previously mentioned, in which there was organic heart disease in only 38.1% of all cases. This emphasizes again what Osler said in 1892 in a discussion on chorea at the meeting of the American Pediatric Society "there is no other disease in which endocarditis is known to be so frequently associated and no other disease in which post-mortem records show such a large proportion of endocarditis."

The type of cardiac disease produced was in every case an involvement of the valves; in a few cases there was further cardiac damage, such as pericarditis or actual myocarditis. The signs of

involvement of the whole heart, pancarditis, did not occur as frequently in this series as in the group of 190 cases of acute rheumatic fever. There was only one case of pericarditis in this series while in the acute rheumatic fever patients there were thirteen such instances or 6.8%. Myocardial involvement as determined by conduction defects occurring during the acute illness was not as common during chorea as in acute rheumatic fever. In the chorea series partial or complete heart block occurred in only one case, or 2.2% of those patients in whom electrocardiograms were taken. In the acute rheumatic fever patients on the other hand, heart block occurred during the hospital stay in fifteen per cent. of the cases so studied. It seems from the above findings that although the incidence of cardiac involvement in chorea is greater than in acute rheumatic fever the extent of the cardiac damage is less.

Effect of Recurrences.—Recurrences are common in chorea and naturally with repeated attacks of chorea the incidence of heart disease increases. In this connection it must be remembered that there are many undiagnosed cases of chorea. Just as rheumatic fever may be represented by mild transitory pains in the joints or muscles so chorea may consist merely in a spell of nervousness, irritability or fidgets. These undiagnosed cases undoubtedly falsify to some degree the statistical incidence of heart disease. This is particularly true in those cases in which a mitral stenosis is found with no history of acute rheumatic fever. Undoubtedly this valvular lesion is the late result in some cases of an undiagnosed chorea. Thayer's[5] figures in regard to recurrences are interesting.

	Single Attack	*Two Attacks*	*Three or More Attacks*
Number of cases of chorea.....	499	163	137
Number of Cardiac Lesions.....	85	42	43
Percentage of Cardiac Lesions....	17%	25.7%	31.3%

In twenty-nine per cent of the patients in this study there had been recurrences of chorea. The incidence of cardiac disease was higher in these twenty-nine cases than in the group as a whole or in the cases without previous chorea. In the whole group, forty-five per cent. of patients had cardiac disease, in the twenty-nine cases with previous chorea fifteen or 51.7 per cent. had heart disease, and in the seventy-one cases with only one attack of chorea thirty or 42.2 per cent. had a diagnosis of organic cardiac disease on their discharge from the hospital.

Effect of Other Infections.—The incidence of cardiac disease was much increased in those cases who had had acute rheumatic fever. Of twenty such cases, fourteen or seventy per cent. had heart disease, while of the remaining eighty cases only thirty-one or 38.7 per cent. had cardiac involvement. Thayer[5] in a much larger series of cases found much the same thing. The converse of this is also true in the series of acute rheumatic fever cases, the incidence of cardiac disease was greater in those who had had chorea. Certainly the occurrence of acute rheumatic fever and chorea in the same patient renders the likelihood of cardiac disease very great.

The occurrence of tonsillitis did not seem to increase the incidence of cardiac disease. Of thirty-four cases with a history of tonsillitis or sore throat, fifteen or 44.1 per cent. had organic cardiac disease.

The Influence of Fever.—The temperature during the attack of chorea may or may not be elevated. Many cases are afebrile throughout; others show slight elevation of temperature, and in some few patients a hyperpyrexia occurs. The latter group was studied to determine the incidence of organic heart disease in the febrile, as compared with the afebrile cases. Since this series is made up almost entirely of children and young adults minor elevations of temperature were disregarded as of too common occurrence at this age to indicate a febrile reaction. The cases were divided therefore into those with temperatures of 99° or less and those with temperatures over 99°. Of the forty cases with temperatures over 99°, twenty-two or fifty-five per cent. had organic disease. Only 38.3 per cent. of the sixty cases with temperatures of 99° or less had such a diagnosis. The occurrence of an elevation of temperature during an attack of chorea would seem therefore to increase slightly the likelihood of cardiac involvement. It is to be remembered of course that endocarditis may occur during chorea without any elevation of temperature. Of the forty-five patients in this whole series who developed organic heart disease only twenty-two had temperatures over 99°. This whole question is of particular interest when considered in relation to the idea that chorea in some cases may be a functional neurosis.

Such afebrile cases have been cited as evidence that chorea is a functional condition. In

a functional disease of the nervous system, however, one would not expect such a large incidence of a type of organic cardiac disease that has the appearance of infection. I believe that the clinical picture of the disease that we know as chorea is due to an infection which involves the central nervous system and often the heart.

Valvular Involvement.—In the forty-five cases of organic cardiac disease the mitral valve was involved in forty-four and the aortic valve in only five cases. In the series of 190 cases of rheumatic fever there were seventy-two instances of heart involvement and of these fifty-six had mitral and thirty had aortic disease. When these two groups are compared the greater frequency of aortic involvement in the rheumatic and of mitral involvement in the chorea group becomes apparent. This is another difference between chorea and rheumatic fever that must be explained if these two diseases are to be regarded as being caused by the same infection. The more frequent involvement of the aortic valve in acute rheumatic fever may be explained in part by the fact that in acute rheumatic fever males are much more commonly attacked than females and it is true that all types of aortic disease more often affects males than females. This is not the entire explanation, however, as in the thirty-four males among the chorea cases the aortic valve was involved in only two cases, or six per cent., whereas in the 119 males in the acute rheumatic fever series the aortic valve was involved in twenty-six cases or twenty-two per cent. The type of rheumatic infection responsible for chorea seems to have a special predilection for the mitral valve.

Heart Irregularities.—The electrocardiographic examination of the heart in these cases showed a much lower incidence of the signs of myocardial involvement than appeared in the group of acute rheumatic fever patients. As mentioned before in this series there was evidence of impaired conduction in only 2.2 per cent. of patients, as compared with fifteen per cent. in the rheumatic fever cases. It is interesting to note that the one chorea case that showed delayed conduction died about five days after this sign appeared.

Permanent heart block of any grade is usually regarded as a serious and progressive disease. There was one patient included in the series of acute rheumatic fever cases that is of interest in this regard. This man had acute rheumatic fever in the Peter Bent Brigham Hospital in 1915. During his illness he developed an aortic regurgitation and electrocardiographic evidence of delayed conduction. He made a good recovery and at the time of his discharge from the hospital his auricular-ventricular conduction time was .32 seconds. He was cautioned to limit his activities as much as possible. Following his discharge he felt perfectly well and has since been working very actively as a city salesman. On re-examination in May, 1922, seven years after his attack of acute rheumatic fever, he shows the typical signs of an aortic insufficiency and his electrocardiogram discloses a P-R interval of .32 seconds. In every other regard he is absolutely fit and has never had any symptoms of myocardial insufficiency. Apparently what ever damage was done to his conducting apparatus has not been progressive.

Although chorea and acute rheumatic fever are probably evidence of the same infection, involving different systems, the effect on the heart is somewhat different for the two diseases. The incidence of cardiac involvement is greater in chorea but the extent of the damage to the heart muscle seems less than in acute rheumatic fever. In the latter there is a much more frequent occurrence of such evidences of generalized heart damage as heart block, auricular fibrillation and pericarditis. Chorea attacks females twice as often as males while rheumatic fever affects males twice as often as females. Possibly the susceptibility of the nervous system of the one and the articular system of the other explains this discrepancy. The greater incidence of mitral disease in chorea and comparatively greater occurrence of aortic disease in rheumatic fever may be partly explained by this sex discrepancy for in males the aortic valve is much more often involved than in females no matter what the causative agent may be. That this is not the entire explanation is evident from the fact that even among males chorea affects the aortic valve much less commonly than rheumatic fever.

Summary.—One hundred cases of chorea and one hundred and ninety cases of acute rheumatic fever were analyzed, from which the following deductions were made.

1. Twenty per cent. of the chorea patients gave a history of previous acute rheumatic fever.

2. The incidence of organic heart disease in chorea was forty-five per cent., while that in rheumatic fever was thirty-eght per cent.

3. Recurrences of chorea increased the likelihood of cardiac involvement.

4. When chorea and acute rheumatic fever had occurred in the same individual the incidence of cardiac complication was greatest, *i.e.*, seventy per cent.

5. Tonsillitis did not seem to affect the occurrence of organic heart disease following chorea.

6. Fever during the chorea slightly increased the likelihood of cardiac damage, although it seemed that endocarditis could develop in a patient with an afebrile course.

7. The aortic valve was much more rarely involved in chorea than in the rheumatic group, while the mitral valve was much more commonly affected.

8. Evidences of generalized heart damage such as pericarditis, conduction defects, or auricular fibrillation were much less common in chorea than in acute rheumatic fever.

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OBSERVATIONS ON TETANY*

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DURING the past year the writer has had the opportunity of studying four adult patients with tetany. A summary of the clinical history is given here. My chief interest has, however, been in an investigation of the concentration of some of the inorganic components of the blood in these cases. The results of these determinations are presented in the present paper and their significance discussed. Three of these patients suffered from "gastric tetany," the result of pyloric obstruction. In the fourth patient tetany followed the intravenous administration of sodium bicarbonate during an attack of acute nephritis.

Summaries of the Cases

A.—*Patients with "gastric tetany."*

(1) J. W., Age 28.—Male.—Admitted March 3rd, 1921—"Stomach trouble" for past year. Examination on admission suggested pyloric obstruction. Vomiting a prominent symptom. On March 6th complained of tingling, numbness and cramps in extremities. On March 7th, while having stomach washed out, he complained of cramps in arms and feet. Five minutes later he went into a tetanic convulsion affecting muscles of face, extremities and abdomen. Conscious throughout. On March 8th patient still complained of cramps. Blood was taken for chemical examination and showed the following findings. Serum: sodium, 287 mgs. per 100 cc; chlorides, 3.55 gms. as sodium chloride per litre; calcium, 10.6 mgs. per 100 cc. Plasma: bicarbonate CO_2, 103 vols. per cent. Calcium lactate, gms. 4 to pint of water was administered by mouth as well as a solution of calcium lactate (gms. 4 to pint) in normal saline by rectal drip. On March 9th he was given a subcutaneous infusion of normal saline. There was no return of symptoms of tetany after March 8th. On March 10th the man was operated on, and a carcinomatous growth producing pyloric obstruction was found. The patient recovered from the operation and was discharged having had no return of his symptoms.

(2) G. S., Age 40.—Male.—Admitted January 28th, 1922—History of "stomach trouble" for past ten years. Ten days previous to admission symptoms became acute with frequent vomiting. On January 27th he took the train to Baltimore for the purpose of entering the hospital. Dur-

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ing the journey the patient became delirious and had convulsive movements of the arms and legs. On admission he was quite unconscious, greatly emaciated and desiccated. The neck was rigid. Respiration shallow and of Cheyne-Stokes type. He died a few hours after admission. A sample of blood was taken shortly before death and showed the following findings. Serum: sodium, 305 mgs. per 100 cc; calcium, 9.4 mgs. per 100 cc; phosphorus (inorganic), 7.2 mgs. per 100 cc. Plasma: bicarbonate CO_2, 130 vols. per cent.; chlorides 2.03 gms. as sodium chloride per litre. Corpuscles: chlorides, 1.10 gms. as sodium chloride per litre. A diagnosis of carcinoma of stomach at the pyloric end with gastric tetany was made. Autopsy showed gastric ulcer with perforation, complicated by subphrenic abscess.

(3) H. G.—Female.—Age 59.—Admitted March 22nd, 1922.—History of vomiting for past twelve years. This had been growing steadily worse for the past six to eight months. Marked loss of weight. A diagnosis of probable gastric carcinoma was made and on March 28th a laparotomy was done. No tumour found. Stomach much contracted. Gall-bladder packed with gall-stones. A cholecystectomy was done. Following the operation the nausea and vomiting persisted. The wound healed satisfactorily. On April 13th patient showed carpopedal spasm, and Trousseau's sign was elicited. Blood was taken for examination and showed the following findings. Serum: sodium, 305 mgs. per 100 c.c.; calcium, 8.8 mgs. per 100 cc; phosphorus, 2.8 mgs. per 100 cc; bicarbonate CO_2, 36.2 vols. per cent. Plasma: chlorides, 3.77 gms. as sodium chloride per litre. The patient up till this time had received rectal enemata of normal salt solution as well as food by mouth. She was now given 500 cc. of an isotonic neutral solution of ammonium chloride intravenously* and a subcutaneous infusion of 1,500 c.c. of normal saline. The symptoms of tetany disappeared shortly after. Forty-five minutes after the ammonium chloride injection, the bicarbonate CO_2 was 53 vols. per cent., and the chlorides 4.55 gms. as sodium chloride per litre. On the following days until April 20th subcutaneous infusions of saline were administered. There was no return of the symptoms of tetany but the vomiting continued. The patient died on April 26th. Autopsy showed a diaphragmatic hernia.

B.—*Patients with bichloride of mercury poisoning and acute nephritis.*

(4) A. C.—Female.—Age 35.—Admitted October 24th, 1921.—Pregnant for six weeks. On October 20th she inserted a tablet of bichloride of mercury into the vagina. Followed shortly by vomiting and cramps in legs. On October 22nd had a sore mouth. Complete anuria since that date. The vomiting continued. The patient on admission October 24th was very restless, showed a marked stomatitis and gingivitis. Severe vaginitis. Blood examination showed the following findings. Plasma: bicarbonate CO_2 32 vols. per cent.; chlorides 4.28 gms as sodium chloride per litre. At 3 p.m. an intravenous injection of 500 c.c. of 5 per cent. sodium bicarbonate was given. Two hours later patient showed carpo-pedal spasm and Trousseau's sign was present. At 7 p.m. venesection was performed and 750 c.c. of blood withdrawn. Blood examination at this time showed bicarbonate CO_2 54.6 vols per cent.; chlorides 3.71 gms. as sodium chloride per litre. A transfusion of 600 c.c. of citrated blood was given. On October 25th urine showed albumen and casts. Blood examination showed the following: serum: sodium 297 mgs. per 100 c.c.; calcium 5.4 mgs. per 100 c.c.; phosphorus (inorganic) 15 mgs. per 100 c.c.; bicarbonate CO_2 65 vols per cent.; chlorides 3.93 gms. per litre as sodium chloride. The patient became oedematous and vomiting more severe. Died on October 26th.

(5) *Patient without Tetany.*

A. F.—Female, age 20.—Admitted November 7th, 1921.—Had been suffering from pelvic inflammatory disease. On November 5th inserted a bichloride of mercury tablet into vagina in order to relieve pain. On morning of November 6th had marked swelling of perineum and intense burning. Since 3 p.m., November 6th, had anuria. On November 7th gums and tongue swollen, teeth loose. On admission to hospital showed oedema of face, marked stomatitis and gingivitis. Oedema of vulva. On November 9th urine showed albumen, but no blood or casts. Blood was taken for chemical examination. The non-protein nitrogen was 100 mgs. per 100 c.c. Serum: sodium, 286 mgs. per 100 cc.; calcium, 8.5 mgs. per 100 cc.; phosphorus (inorganic), 7.2 mgs. per 100 cc.; bicarbonate, CO_2 50 vols

*This patient was in the service of Dr. W. S. McCann who has reported the effect of ammonium chloride administration in the Proceedings of the Society for Experimental Biology and Medicine, Vol. 19, No. 8.

per cent.; ch orides, 4.47 gms. per litre as sodium :hloride. On November 10th became stuporous and more oedematous. Died on November 11th. The diagnosis of bichloride of mercury poisoning w th acute nephritis was made.

The fo lowing table shows the blood findings in these five cases, with normal values appended.

The reduction in the chlorine concentration of the serum in "gastric tetany" is a well recognized phenomenon. It has been noted by MacCallum[2] and by Hastings, Murray and Murray[1] in experimental "gastric tetany" in dogs. It is without doubt due to the loss of the chlorine ion by way of the stomach. The low chlorine concentration of the serum in the pat ents with bichloride poisoning was in all probability due to the vomiting which accompanied this condition.

		Normal	*Gastric Tetany*			*Bichloride poisoning with acute Nephritis*	
			I	II	III	*Tetany*	*No Tetany*
Serum	Sodium mgs. per 100 cc.	320-340	287	305	305	297	286
Serum and Plasma	Chlorides as NaCl gms. per litre	56.0-6.00	3.55	2.03	3.77	3.93	4.47
Serum and Plasma	CO_2 bound as bicarbonate. vols. per cent	55-73	103	130	86 2	65	50
Serum	Calcium mgs. per 100 cc.	9-10.5	10.6	9.4	8.8	5.4	8.5
Serum	Phosphorus (inorganic) mgs. per 100 cc	1.-3.5		7.2	2.8	15	7.2

I am indebted to Dr. W. S. McCann and Dr. F. F. Tisdall for permission to use their figures for several of the above determinations.

Summary of Table

In the patients with gastric tetany the sodium concentration of the serum was moderately but definitely reduced. A very striking reduction in the concentration of chlorine occurred in these cases. On the other hand the bicarbonate concentration was markedly increased. In contrast to what has been found in infantile tetany where the calcium of the serum is regularly diminished we found the concentration of this element essentially normal in these cases.

In the cases of acute nephritis following bichloride poisoning there was a diminution of both the chlorine and sodium concentration of serum. The bicarbonate concentration while essent ally normal showed a higher figure in the pat ent with tetany. The concentration of calcium in the serum was reduced in both patients but reached a much lower level in the patient with tetany. The inorganic phosphorus concentration of the serum was increased in both patients, but the increase was more marked in the patient with tetany.

As far as we are aware, Hastings, Murray and Murray have been the only investigators who have reported a low sodium concentration in the serum in cases of "gastric tetany." They noted this in experimental tetany in two dogs following pyloric obstruction. Gamble and Ross (unpublished work) have confirmed these findings in experimental "gastric tetany" in dogs.

The increase in the bicarbonate CO_2 concentration in the serum in "gastric tetany" has been noted by MacCallum,[2] McCann[3] and by Hastings, Murray and Murray[1]. These writers were all working with dogs. This increase is probably due to the fact that the much greater reduction of chlorine than of base (as measured by sodium) in the serum uncovers base, which combines with carbonic acid the only available acid. The increase in bicarbonate results.

The normal values obtained for calcium in the serum of the patients with "gastric tetany" are of interest in view of the much discussed relationship of this element to tetany. MacCallum[2] and Hastings, Murray and Murray[1] noted the same findings. The calcium values obtained in the patients with bichloride poisoning are significant. The patient with tetany showed a low calcium value whereas the one who did not develop tetany had a nearly normal value. Marriott and Howland[4] have reported low calcium values in certain types of nephritis.

It is significant that the phosphorus (inorganic) concentration in the serum was definitely increased in both cases of bichloride poisoning. This phosphorus retention is probably a measure of diminished kidney function. The most marked increase was in the patient who developed tetany

and showed the lower calcium concentration. This inverse relationship has been pointed out by Marriott and Howland[4] in certain types of nephritis.

Discussion

The occurrence of "gastric tetany" in human beings and its association with pyloric obstruction has long been recognized. It was produced experimentally in dogs by MacCallum[2] and his co-workers, by McCann[3] and by Hastings, Murray and Murray[1]. MacCallum mentioned the possibility of a true alkalosis being present in this condition. He thought it possible that the disturbed equilibrium of acids and bases in itself was the cause of the symptoms. McCann concluded that tetany was a condition of alkalosis in which a disproportion between the rates of secretion of acid and alkalies by the gastro-intestinal tract might be a factor. Hastings, Murray and Murray demonstrated a slight change in the pH of the blood toward the alkaline side. They did not, however, consider that there was any proof that alkalosis *per se* could cause tetany. They had no explanation to offer for its causation.

It has been recognized for several years that symptoms of tetany might follow the administration of large doses of sodium bicarbonate. This is more likely to occur when the kidney function is impaired as a result of nephritis. Howland and Marriott[5] have reported several of these cases. A case in almost all respects similar to my case following bichloride poisoning was reported by Harrop.[6] In his patient the bicarbonate CO_2 of the serum rose to 80 vols. per cent. following the intravenous administration of sodium bicarbonate. Tetany resulted. There was, however, no diminution in the calcium of the serum. He concluded that the condition was associated with, if not directly precipitated by, the suddenly increased alkalinity of the blood due to the sodium bicarbonate injection.

In infantile tetany it has been conclusively demonstrated by Howland and Marriott[5] that there is a marked reduction in the calcium concentration of the serum. They found no evidence of a change in the pH of the blood toward the alkaline side. I have examined the blood of a number of these patients and have found no increase in the bicarbonate of the serum. Kramer, Tisdall and Howland[8] found the sodium concentration of the serum normal in infantile tetany.

It must be recognized, therefore, that in these three types of tetany *viz:* gastric tetany, tetany following bicarbonate injections and infantile tetany we meet with a common symptom although the blood of the patients shows a totally different picture. In infantile tetany the calcium concentration of serum is invariably reduced; in gastric tetany it is normal, whereas in the tetany following bicarbonate administration it may be normal or reduced. In infantile tetany the bicarbonate of the blood is normal; in gastric tetany it is greatly increased; in the tetany following bicarbonate administration it is increased. In infantile tetany the chlorine content of the blood is normal, in gastric tetany it is greatly reduced and in the tetany following bicarbonate administration it may be reduced. In infantile tetany there is no evidence to suggest an alkalosis, in gastric tetany there may be a slight change in the pH of the blood toward the alkaline side. The phosphorus (inorganic) concentration of the serum is normal in infantile tetany. It may be increased in gastric tetany and a'so in the tetany following bicarbonate administration. The sodium concentration of the serum is normal in infantile tetany, in gastric tetany it is definitely reduced.

Is it possible to explain on a common basis these three types of tetany in which the blood findings are so diverse? We shall not discuss here the pathogenesis of another type of tetany *viz,* that following parathyroid insufficiency.

It was first observed by Ringer that solutions of calcium salts inhibited muscle twitchings caused by sodium chloride solution. From the work of numerous physiologists in recent years it is permissible to assume that neuro-muscular irritability is dependent upon the relationship between the sodium and calcium ions in the fluids bathing these tissues. A reduction of the $\frac{Ca}{Na}$ ratio in the body fluids would then be liable to produce tetanic contractions in voluntary striated muscle. If the concentration of these cations in the blood serum is a measure of their concentration in the extra-cellular body-fluids, we might be led to expect a reduction of this ratio in all types of tetany. This, however, is not the case. It must be remembered, however, that it is the calcium ion which in all probability represents the functionally active calcium. The present chemical methods serve to determine not the calcium ion concentration but the total calcium of the serum. This may be divided into three fractions: (1) the calcium in combination

with protein, (2) the calcium which exists as ionized calcium, and lastly (3) a fraction which exists as the undissociated calcium salt. The relative proportion of these various fractions is still a matter of debate. It is conceivable, however, that the calcium ion concentration is directly proportional under constant conditions to the total calcium concentration so that when the latter is reduced the ionized may be correspondingly reduced. On the other hand, Rona and Takahashi[8] have shown that the calcium ion concentration of a solution depends not only upon the actual calcium concentration but also upon the bicarbonate ion concentration and upon the hydrogen-ion concentration.

This is expressed in the following equation: $\frac{(Ca^{\cdot\cdot})\ (H\ CO_3')}{(H^{\cdot})} = K$. In other words where $Ca^{\cdot\cdot}$ represents ionized calcium, HCO_3' the bicarbonate ion, and $H^{\cdot}$ the hydrogen ion (or pH), any variation in one of these factors causes a change in one or both of the other factors of the equation. Thus the concentration of calcium ions would vary inversely with a variation in the bicarbonate ion, the hydrogen ion concentration remaining constant, and directly with the hydrogen ion concentration, the bicarbonate ion remaining constant. They found that a solution of calcium bicarbonate whose H-ion and bicarbonate concentration corresponded to that of the blood serum showed a concentration of dissolved calcium of slightly over 2 mgs. per 100 cc. It has, however, been shown that the calcium content of blood serum varies from 9-11 mgs. per 100 cc. By dialysis experiments on serum, however, these authors were able to show that all but a small percentage of the calcium in serum was in a freely diffusible form. The small indiffusible fraction they considered to be in the form of a calcium-protein compound. Therefore they concluded that the calcium bicarbonate of the serum must be present in a supersaturated solution, due to conditions more favourable to solution in serum than in pure salt solutions. Michaelis[9] from Rona and Takahashi's figures calculated the solubility of calcium for the conditions obtaining in blood plasma as 2.2 mgs. per 100 cc. Brinkman and Van Dam[10] measured the actual concentration of ionized calcium in serum by a special method. They found a concentration of 2.2 mgs. of ionized calcium per 100 cc., thus agreeing with the value calculated by Rona and Takahashi. They stated that about 25% of the calcium was present as a colloidal calcium-protein compound. Both Brinkman and Van Dam and Michaelis considered that the calcium not in the form of a calcium-protein compound and not ionized must be present in the form of non-dissociated but truly dissolved calcium salt ($Ca\ (HCO_3)_2$). While the exact distribution of calcium in the blood serum is still undecided it has been clearly shown that the ionization of calcium in serum depends not only upon the total calcium concentration in the serum, but also upon the concentration of the hydrogen and bicarbonate ions.

Collip and Backus[11] in a study of the tetany induced by forced breathing considered that there was a mild alkalosis as measured by a decrease in the ratio $\frac{CO_2 \text{ tension of alveolar air}}{CO_2 \text{ combined of plasma}}$, the carbon dioxide tension of alveolar air being considered to be in equilibrium with the dissolved carbon dioxide. Collip[12] made the interesting suggestion that this change toward an alkaline reaction might, by disturbing the kation equilibrium, make the calcium ion less available in the tissues and result in increased neuromuscular irritability. Grand and Goldman[13] in the same type of experiment showed a definite increase in the alkalinity of the blood by pH determinations. They measured the calcium concentration of the serum and found no decrease, in fact they demonstrated a slight increase. These authors considered the possibility that, with the lowered carbon dioxide tension of the blood from over ventilation and resulting alkalosis, a portion of the calcium might be precipitated or in some way rendered inactive, although still present in the blood. However, they summed up by leaving the rôle of calcium unexplained and considered that the underlying factor in this condition was the alkalosis.

Freudenburg and Gyorgy[14] were the first to apply the formula of Rona and Takahashi to the explanation of tetany. These authors considered that under normal conditions calcium in the body cells is mostly bound to the tissue proteins. Any condition which removes this calcium from the protein of muscle and nerve cells results in increased neuro-muscular irritability. They considered that the ionized calcium of the blood was in equilibrium with the bound calcium of the tissues. Therefore any marked reduction in the ionized calcium of the blood would result in withdrawal of calcium from the tissues and resultant tetanic symptoms.

In discussing the work of Freudenberg and

Gyorgy one feels that they deserve credit for emphasizing the importance of the ionized calcium of the blood. Their explanation of the mechanism involved is, however, open to criticism. In the first place it is difficult to accept their explanation as to the manner in which a reduction of the ionized calcium produces tetany. A change of the pH of the blood in the direction of alkalinity will necessarily result in a concomitant change in the tissue fluids, whose pH varies very slightly from that of blood. This would result in increased binding of calcium by protein in the cells rather than the removal of calcium. In fact they themselves have experimentally shown this[15] and their explanation of its different action *in vivo* is unconvincing. It is more likely that the simple reduction in the ionized calcium of the blood and extra cellular fluids bathing the cells results in an increased neuro-muscular irritability. These authors have also summarily disposed of calcium determinations on serum as valueless, quoting the work of Denis and Talbot[16] to show that low calcium values were found in other conditions in children such as pneumonia as well as in tetany. It has been clearly shown, however, by Howland and Marriott[5] that a low calcium in serum is a constant finding in infantile tetany and that in no other conditions except occasionally in nephritis and after parathyroidectomy are values below 7 mgs. per 100 cc. obtained. These authors also demonstrated that there was no change in the pH of the blood in this type of tetany. I have never found an increase in the bicarbonate of the blood in infantile tetany. Therefore it is probable that the low absolute calcium value of the blood in this condition results in a low ionized calcium, the other factors of the Rona and Takahashi equation being fixed. Freudenberg and Gyorgy made no attempt to explain infantile tetany It is significant that in one experiment on infantile tetany by Gamble and Ross (unpublished work) the administration of ammonium chloride stopped the symptoms without increase of the calcium in the serum. The bicarbonate was greatly reduced and this probably brought about an increase of the ionized calcium.

If one assumes, therefore, that the symptoms of tetany are the result of a diminution in the ionized calcium in the blood, it supplies an explanation for the occurrence of a number of types of tetany which hitherto have apparently had no common basis.

In the tetany from over ventilation of the lungs the reduction in the H-ion concentration (increase in alkalinity) is relatively greater than the reduction in the bicarbonate ion. Therefore calcium ionization is reduced and tetany results.

In "gastric tetany" the bicarbonate ion concentration is increased and as a result a reduction in the calcium ion takes place. In my cases there was a marked increase in the bicarbonate concentration of the blood. Unfortunately no pH determinations of the blood were made so that we do not know whether a true alkalosis with reduction in the hydrogen-ion concentration was also present. This, if present, would still further favour a reduction in the ionization of the calcium. As previously noted the absolute calcium values for the blood were normal. The effect of ammonium chloride injections in one case was to reduce the bicarbonate ion and possibly shift the reaction of the blood in the direction of acidity. Both these factors would increase the ionized calcium of the blood and stop tetany.

An increase in the phosphate ion of the blood probably acts in the same way as the increase in the bicarbonate ion: It reduces the calcium ionization and if this is carried far enough tetany results. We might here note the work of Binger[17] who produced tetany in dogs by the intravenous injection of phosphate solutions. He found, however, that if the solution injected were more acid than pH6 no tetany resulted, although in all cases he was able to reduce the calcium of the serum from its normal level to between 6-7 mgs. per 100 cc. From this it appears that the administration of acid phosphates increased the hydrogen ion concentration of the serum, so that even with an absolute decrease in the calcium concentration there was sufficient ionized calcium to prevent tetany.

In the two cases of acute nephritis following bichloride poisoning we have an interesting contrast. Two factors probably favoured the production of tetany in the first case. In the first place there was a marked retention of inorganic phosphorus in the serum and a low calcium concentration. This phenomenon has been shown by Marriott and Howland[4] to occur in severe forms of nephritis. The reduction in the calcium probably is produced by the increase in the phosphate ion. This follows the principle of the solubility product constant for slightly soluble salts. In the second place the injection of sodium bicarbonate by increasing the bicarbonate ion would tend to diminish the ionized calcium in a blood already low in absolute calcium concentra-

tion with resulting tetany. In Case 5 there was only a moderate phosphate retention and a slightly low calcium concentration with no evidence of tetany.

From the above evidence it appears probable that the part played by calcium in the production of tetany depends upon the ionized form of this element. The evidence brought forward is indirect, and until direct measurements of ionized calcium in the serum are available the proof is not possible.

Treatment in Tetany

A word as to the treatment in tetany. In infantile tetany Howland and Marriott[5] have shown the value of calcium chloride in abolishing the symptoms of tetany and in raising the calcium content of the serum. It probably serves a double purpose. It raises the absolute amount of calcium in the blood and reduces the bicarbonate. Both these factors would tend to increase the ionized calcium.

In the types of tetany where the calcium value is normal, substances which will reduce the bicarbonate and tend to increase the acidity of the blood are required. Among these are calcium chloride, ammonium chloride and hydrochloric acid. These may be given by mouth. If conditions are such that no absorption takes place as in pyloric obstruction or in continuous vomiting, ammonium chloride may be given intravenously. The solution must be isotonic and neutral. We should here suggest the probable value of the neutral salt sodium chloride in some of these cases. We have found in the cases described in this paper an absolute reduction in the base of the blood as measured by sodium (which constitutes 95% of total base in the blood). Hastings, Murray and Murray[1] and Gamble and Ross (unpublished work) have found the same condition in dogs with pyloric obstruction. In view of the great many functions which an adequate base concentration in the body fluid fulfils it would seem logical to bring this up to normal. Some experimental data supports this view. MacCallum[2] in experimental tetany in dogs with pyloric obstruction found that the symptoms of tetany could be prevented or relieved by sodium chloride injections, whereas the injections of hydrochloric acid were much less satisfactory. He was unable to give an explanation for this. Gamble and Ross (unpublished work) have compared the effect of ammonium chloride and sodium chloride injections (intraperitoneal) on dogs with tetany from pyloric obstruction. Both these salts relieved the symptoms of tetany, but the dogs who were given ammonium chloride died after a few hours, whereas those who were given sodium chloride lived comfortably for days. As mentioned above, these dogs all showed a lowered base content in the serum as measured by the sodium. This fell steadily until death. Following the injection of ammonium chloride the base continued to fall although the chloride content of serum rose and the bicarbonate fell. Where sodium chloride was given the base in blood remained at an almost normal level, and not until this began to drop did the dog show symptoms of malaise. At the same time the bicarbonate and chloride values remained almost constant. It appears, therefore, that the logical treatment in these cases is to hold up the level of the sodium and chlorine in the blood by administration of sodium chloride, and as an emergency measure a reduction of the bicarbonate may be brought about by such substances as hydro- chloric acid, ammonium chloride, or calcium chloride until the normal equilibrium between kations and anions has been reestablished by sodium chloride.

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ACUTE LEUKAEMIA IN A CHILD*

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THE following case illustrates the essential features of leukaemia as it occurs in infants and children.

Case No. 27492.—Charles O.,—aged 6 years, was admitted to the Hospital for Sick Children, November 14th, 1921. His family history and past history had no bearing on the present illness.

Present Illness: Father observed that the boy appeared rather listless for the past four months, but until recently he thought it was just due to laziness. Slight pallor was noticed the middle of September. About October 1st, the patient complained of headache, and pain in both shin bones, and the following week complained also of sore throat and pain in the right side of chest. He slept a great deal and became tired with the least exertion. About October 21st, the abdomen was observed to be more prominent than usual. The symptoms gradually became more marked and on November 13th, the patient was delirious for a time. He was admitted to the Hospital for Sick Children the following day.

Physical Examination on Admission: The patient is a well developed and fairly well nourished boy with moderate pallor of the skin and mucous membranes. There are fine petechial haemorrhages over the anterior surface of the neck and chest and also a few haemorrhages on the right leg just below the knee. Some bloody crusts are present in both nares. There is general enlargement of the cervical, axillary, epitrochlear and inguinal glands. Some of the axillary glands are about 5 m.m. in diameter. The gums and teeth are in fairly good condition, although some pyorrhoea is present. The tongue and pharynx appear normal and the tonsils are buried. The lungs are clear. The heart is not enlarged and no murmurs are heard. The abdomen is quite distended and the superficial veins are prominent. Some tenderness is present on palpation over the epigastric region. The liver extends to 2 c.m. above the level of the umbilicus (8 c.m. below the costal margin) and the spleen 5 c.m. below the costal margin. Nervous, genito-urinary and osseous systems are apparently normal.

November 17th.—The liver and spleen have both increased in size since admission. The liver now extends to 2 c.m. below the level of the umbilicus (12 c.m. below the costal margin) and fills the greater part of the right side and epigastric region of the abdomen. The spleen extends to 8 c.m. below the costal margin and is quite firm. The patient had a haemorrhage from the nose on November 15th.

November 18th.—Petechial haemorrhages on neck are darker. There is slight bleeding around left lower incisors. Priapism is present.

November 19th.—Priapism is still present. Petechial haemorrhages are present on the back. There is some bleeding from the right upper incisors. The liver extends to 13 c.m. below the costal margin. The general glandular enlargement has not increased perceptibly. No heart murmurs are heard.

November 21st.—Has been vomiting yesterday and to-day. Priapism is still present.

November 22nd.—The spleen and liver have both diminished in size. The spleen extends to 5 c.m. below the costal margin and the liver 11 c.m. There is bleeding from the gums. Has vomited brown fluid streaked with bright red blood. Priapism is still present.

November 23rd.—There has been profuse bleeding from gums and nose. The pulse is barely perceptible. A systolic murmur can be heard over the praecordium. Liver is palpable 6 c.m. below the costal margin. The spleen cannot be felt. Died at 3 p.m.

BLOOD EXAMINATION

Date	*Red Blood Cells*	*White Blood Cells*	*Hbg. per cent*
Nov. 15.....	2,110,000	272,000	55
Nov. 17.....	2,460,000	427,000	50
Nov. 19.....	———	665,000	—
Nov. 20.....	2,090,000	642,000	45

*From the Wards and Laboratories of the Hospital for Sick Children. Toronto, Canada. Read before the Section of Pathology, Academy of Medicine, Toronto, October, 1922

Examination of the blood smears: The red blood cells show some anisocytosis and poikilocytosis. A very occasional nucleated red blood cell is seen. Very few platelets are present. The normal polymorphonuclear neutrophils constitute about five per cent., and the normal small lymphocytes somewhat less than five per cent. of the total white blood cells. About ten per cent. neutrophilic myelocytes and an occasional eosinophilic myelocyte may be counted. Great numbers of immature cells are seen which vary considerably in size, the majority, however, being a little larger than a normal polymorphonuclear neutrophile. The nuclei of these cells are large and very finely reticulated. With the Wright stain they stain a faint pink-purple. Three or more nucleoli are present in the majority of these cells. The protoplasm is scanty and as a rule stains a faint blue but in some cells stains a dark blue. A few ruptured cells are present. The blood picture remained essentially unchanged throughout the period of observation.

The majority of the haematologists to-day believe in the dualistic theory of the origin of the white blood cells. They consider that the lymphocytes, which are non-granular, are produced from the lympho-poietic tissue and the polymorphonuclear cells, which are granular, originate from the myelo-poietic tissue. No granules are visible by the ordinary staining methods in the myeloblast which is the precursor of the myelocyte from which in turn the polymorphonuclear cells are formed. The myeloblast, however, except when very immature, can be differentiated from the lymphocyte by the use of the oxydase reaction originally advanced by Winkler and applied to the blood and tissues by Schultze, Evans, and Graham. By the use of this reaction, granules show up quite definitely in the myeloblasts, while the lymphocytes are not affected.

The immature cells seen in the present case might be either myeloblasts or immature lymphoid cells. Here the oxydase reaction showed only about ten per cent. granular cells, practically all the large monuclear forms having no granules. This does not rule out the possibility that these large cells may be myeloblasts as it is well known that the oxydase reaction is of little value in differentiating the very young forms of cells.

Autopsy.—The following notes from the autopsy report by Dr. I. H. Erb, Pathologist to the Hospital for Sick Children, are of interest.

The liver extends to 6 c.m. below the costal margin and the cut surface is pinkish-red in colour. The lower border of the spleen is 1 c.m. above the costal margin. The surface presents a wrinkled appearance as though the spleen had recently diminished in size. The cut surface is also reddish-pink in colour. There is enlargement of the mesenteric and bronchial glands. In the gastro-intestinal tract the solitary lymph follicles and Peyer's patches are considerably enlarged and very firm. These changes are most marked in the terminal two feet of the ileum. No haemorrhagic areas are present in either the large or small intestines but there are numerous submucous petechial haemorrhages in the stomach. These are most numerous in the region of the fundus. There are no areas of ulceration.

There are numerous haemorrhagic areas in the subpericardial tissues, particularly over the left side of the heart. Petechial haemorrhages are also present under the endocardium of the right auricle and right ventricle, but no haemorrhages under the endocardium of the left side of the heart. The lungs show some oedema and congestion posteriorly. A portion of the sacrum was removed for microscopic examination, and the cut surface was seen to be pinkish-yellow in colour.

Microscopic examination of the tissues shows marked infiltration with the same type of mononuclear cell present in the blood. This infiltration is most marked in the liver, kidneys and lymphatic glands. In the liver it occurs chiefly around the periphery of the lobules. In the kidney it is present in the interstitial tissues while in the lymphatic glands practically the whole of the normal gland tissue has been replaced by these cells. In the lymphatic glands particularly, there are also present fairly large numbers of eosinophilic myelocytes and some neutrophilic myelocytes.

Discussion

Leukaemia in children is practically always acute. Myeloid leukaemia is unusual, eighty to ninety per cent. of cases being lymphoid in type. It is seen that the white blood count in our patient is quite high. The count, in about fifty per cent. of cases of lymphoid leukaemia, is normal or even sub-normal. The lymphoid cells in these instances, however, constitute over ninety per cent. of the total leucocytes. The blood picture from our case presents unusual difficulties in differentiating the type of leukaemia present, and it is impossible from this alone to make a definite differential diagnosis between lymphoid and myeloid leukaemia. However, from the clinical picture (the bone pains and the great enlargement of the spleen), together with the tissue sections, it is probable that the case belongs to the acute myeloid type.

Clinically, the essential features of leukaemia as it occurs in infants and children, are here illustrated. In regard to the onset, a study by the author of a number of cases of this disease, clearly demonstrated that leukaemia most frequently begins with weakness and pallor. In the present instance these signs were observed some weeks before any other symptoms appeared. The older children usually complain of headache. This was the first definite symptom of which our patient complained. Enlargement of the abdomen and haemorrhages are the initial signs in only a small per cent. of cases. In the present

case, these signs did not appear until after the other symptoms had become well marked. Although the onset could scarcely be termed abrupt the severity of the symptoms increased with great rapidity.

In practically every case of leukaemia pallor of the skin and mucous membranes is present. Frequently the skin assumes a peculiar lemon yellow colour, which is due to the marked reduction in the number of red blood cells and the total haemoglobin. Only a moderate degree of pallor was present in our patient. The spleen is enlarged in almost every case of leukaemia, although in only thirty to forty per cent. of patients is the enlargement as marked as was found in the present instance. In the majority of cases the lower border of the spleen is from one to five c.m. below the costal margin. The next signs in order of frequency are enlargement of the liver and of the superficial glands. The increase in the size of the liver occurs almost as frequently as enlargement of the spleen, although as a rule the degree of enlargement is less. The superficial glands are usually enlarged but rarely exceed 1.0 c.m. in diameter. Haemorrhages from the nose and mouth, and ecchymotic areas or petechial haemorrhages of the skin are present in about fifty per cent. of cases. These signs, as well as those discussed above, stand out clearly in the picture presented by our patient, and the whole constitutes a typical clinical example of this disease in a child.

The author wishes to acknowledge his thanks to Dr. Alan Brown, Physician-in-chief, for permission to report this case.

SOME POINTS IN THE DIAGNOSIS AND TREATMENT OF HYPERTHYROIDISM

H. W. Riggs, M.D.

Vancouver

THE effects of hyperthyroidism are chiefly confounded with the symptom neurasthenia. Many a patient has been given bottle after bottle of tonic to cure a "run-down" condition, who was suffering from incipient hyperthyroidism, and both doctor and patient wondered why improvement did not take place; or the patient was put in the class of neurasthenics and treated with indulgence and some fatherly advice. However, to-day as the symptoms of hyperthyroidism have become better known, the diagnosis of the disease is easily made. To those who have access to a basal metabolism machine there should be little trouble. The following case will illustrate the need for differentiation:

> Mrs. E., age 41; married; no children; slight build; has had periodic nervous breakdowns; now comes with history of being easily tired; short of breath; fine tremors in hands; and says that when she exerts herself has a trembling feeling all through her. Has a small goitre; pulse 96; weight 115 lbs.

A very suspicious history, but the basal metabolism test revealed a rate of —1. This case was put on tonics with a little thyroid added, and made a splendid recovery. Without the metabolism test, this case would undoubtedly have been regarded as one of hyperthyroid trouble, and might have been subjected to a needless operation. Another case will illustrate the advantage of the test in differentiating a thyroid from a heart case.

> Mrs. S. M.; age 39; two children; always inclined to be anaemic. Goitre began at fifteen years. At age of thirty-two goitre was quite large. Had tonsil trouble for two or three years. Tonsils removed at thirty-six. Had 'flu shortly after and since then has had palpitation and shortness of breath; also easily tired. During the last two years, the goitre has decreased somewhat in size, pulse varying from 108—120. Metabolism rate—+20.

Here the history of influenza, with the presence of an old goitre made it difficult to say whether the heart symptoms were a sequel of 'flu or due

to hyperthyroidism. The basal metabolism test decided in favour of the thyroid.

There are other means of determining the presence of hyperthyroidism although none so accurate. The Goetsch test of injecting ½ c.c. of adrenalin subcutaneously and watching for the signs of acute hyperthyroid effects is a valuable one, but should never be done in the office. If positive, this test uses up all the strength of the patient and he should be kept in bed for at least the day following. A case illustrates the value and also the danger of this test:

> Mrs. K. C., age 28; three children, quite well until a year ago; developed marked enlargement of thyroid; became easily tired, short of breath; weight decreased from 156 to 126. Pulse, 100. As no metabolism machine was available, was given the Goetsh test. This left the patient so weak that she collapsed on the way home. Pathological report after operation was "diffuse hyperplastic goitre."

Another simple method is to give thyroid substance for two or three days, taking the pulse rate and blood pressure previously. Marked accentuation with increase in pulse rate and blood pressure means an already increased thyroid secretion. This method is not so accurate as either of the two foregoing.

If the thyroid takes part in the effective destruction of the toxins of disease, then it seems reasonable that the first step in treatment of hyperthyroidism should be to lessen its activity by removing the source of the toxins. Hence, removal of diseased tonsils, treatment of pyorrhea, and the overcoming of colonic stasis, if any, or all exist, are the first lines of treatment. If the hyperthyroidism is slight, this treatment, together with rest, may be sufficient to effect a cure. With this is combined medication consisting of quinine hydro-bromide, calcium lactate, and ergotin.

Periods of remission in hyperthyroidism are probably due to the enforced rest of the system caused by the inability to carry on, thus allowing a slower circulation, a lessened activity on the part of the gland, and the gradual building up of the resistance of the body, which leads to subsidence of activity in the area affected. Any reinfection or breaking down of the resistance of the system by too great exertion or worry means increased toxins, with a consequent increase in thyroid secretion with its train of symptoms.

Failing to remove the cause, or finding that the changes in the thyroid are so great that removal of cause no longer means a sufficient lessening of output, we must look for other methods of control. At present X-rays are being widely used for this purpose. The effect of X-rays on the thyroid is probably two-fold. It causes destruction of the new gland cells which have been formed, and, in addition, it causes increase in the connective tissue between the lobules, thus interfering with the lymphatic circulation by which the secretion reached the blood. Theoretically, this line of treatment should be ideal. Practically, it has not so worked out. Unless X-rays of sufficient strength are given to kill all the new cells, the disease, after a longer or shorter period of quiescence, again becomes active upon the slightest stimulation. If, on the other hand, sufficient is given to destroy the new cells, it must be remembered that the regular gland cells are also affected and the inter-lobular connective tissue is much increased shutting off the lymphatics, and there is now hypo-thyroidism. A case in point is the following:

> Miss L., age 23; symptoms of hyperthyroidism; one lobe removed; patient better for a time, then symptoms recurred; ligation of superior artery, followed by X-rays. Some months after the examination by metabolism test gave —7 rate.

My experience with X-rays leads me to believe that they should be chiefly used to modify serious cases so that they may be operated upon with safety. This brings up the question of when an operation should be performed, and it is in this regard that the basal metabolism rate is most useful. A high rate is a contraindication to removal, and X-ray ligation, or simple rest must be used until such time as the rate is down to a safety point. I believe that a rate of less than +40 should be obtained before removal is done. Naturally, the lower the rate, the less the risk. A word of caution regarding the metabolism test is needed. In these cases a single test is, I believe, misleading, and an average struck from the results of three or four tests will give a more exact idea of the true metabolic rate. I have found as much of a drop as 20% in rate between the first and second tests, the latter being taken on the succeeding day.

In such cases as do not respond readily to medical treatment, operation remains the method of choice, and X-rays should be used chiefly as a preparatory course. For several years I have practised the resection of both lobes in prefer-

ence to removing one lobe. It gives a symmetrical result and removes more of the tissue which may be hyperplastic. In doing this, the superior thyroids are ligated and the upper poles resected, then after clamping the veins the capsule is inside at a point which will give sufficient flap and a V-shaped section of the lobe is made. This method does not cause as much haemorrhage as one would expect. A branch of the inferior thyroid about the middle of the posterior section, and frequently one from the superior artery near the upper pole, will need to be ligated. After checking the bleeding, the outer flap of the capsule is brought over and sutured to the inner which lies along the trachea.

The great risk of the operation is in the increased absorption which takes place from the raw areas of the gland itself, and also from the fascial planes which have been opened up, and over which the blood and secretion from the thyroid cells spread. Recently, I have adopted two methods of preventing this absorption. The first is to coagulate the albumen of the surface cells of the wound by packing in sponges soaked in pure alcohol. This coagulated layer tends to prevent absorption of the secretions. The other measure is to remove the secretion until nature has had an opportunity to build up a protecting wall. This is done by utilizing the principle of osmosis which induces an outpouring of plasma and lymph, and in this way carries off the secretion which would be otherwise absorbed. A small Dakin's tube is used carrying two small rubber tubes to either side of the trachea. To the end of the Dakin's tube is attached a small rubber tube which is brought out through the dressings and kept covered with sterile gauze, The insertion of these tubes does not in any way interfere with the closing of the wound by means of a sub-cuticular suture. The after-treatment consists of flushing the wound with a hypertonic salt solution every hour. This is done with a small syringe. The injection of this solution not only washes away the secretion which oozes from the cut surface of the gland, but, in addition, causes an outpouring of fluid from the surrounding tissues, which effectively prevents absorption. My experience with this form of after-treatment is such that I believe the severity of operative procedures in serious cases is greatly lessened thereby.

A CASE OF PRIMARY SARCOMA OF THE HEART*

L. G. Pinault, M.D., F.A.C.S.

Campbellton, N.B.

MRS. D., aged forty-seven, came to the hospital suffering from a generalized oedema, marked dyspnoea and a disturbance of digestion. The first symptoms began two months previously with dyspnoea, and swelling of lower limbs and abdomen. Family and personal history were good.

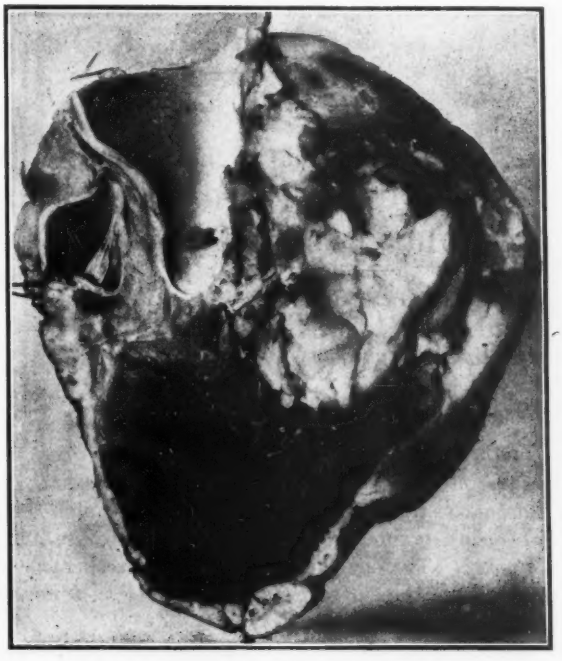
Physical examination revealed oedema of both legs, both arms, and of the whole trunk, the right side of the body being more swollen than the left; there was a large amount of free fluid in the peritoneal cavity and a considerable effusion in the right chest. The edge of the liver was felt two inches below the ribs. The heart sounds were regular but faint and gave the impression of being heard through a hydropericardium. Pulse was regular but weak and very compressible. The respirations were short and embarrassed. The left lung was apparently norman; the right side was dull to percussion and no breathing sounds could be heard. The radiograph showed the right side filled with fluid, and mediastinal and heart shadows larger than normal. The diagnosis was made of myocarditis with the probability of a mediastinal tumour interfering with venous return. Ascitic fluid on examination was found to contain numerous lymphocytes. The urine had albumin and acetone; the blood count gave 4,800.000 R.B.C., and 13,800 W.B.C.

Several aspirations were made to relieve the ascites and pleural effusion and the patient was given various heart stimulants but died four weeks after entering the hospital.

*Reported to New Brunswick Medical Society

Post mortem: The right chest was completely filled with bloody serum and the lung retracted to the size of the fist. The left pleural cavity was normal excepting a few adhesions of the lung to the parietal pleura. The mediastinum contained a mass of hard enlarged lymph nodes entangling the large blood vessels at the base of the heart. The heart was enlarged and its whole surface was whitish and seemed covered with a coat of fat. The base of the heart was irregular and hard. The right auricle was distended by a grayish tumour the size of a hen's egg which completely filled its cavity. The left auricle, both ventricles and the valves were apparently normal. The abdomen was negative excepting the liver which was slightly hypertrophied and of a nutmeg colour.

Section of the tumour examined by Dr. Abramson, provincial pathologist, showed it to be a round-celled sarcoma.



Primary round-celled sarcoma of the heart

Primary tumours of the heart are very rare and Hektoen who reported three cases in 1893, states the reports of only 110 cases of cardiac tumours were to be found in the index catalogue of the Surgeon General's library and most of them were secondary.

Hirschfelder states that Berthenson collected twenty-eight primary tumours of the heart, nine of which were sarcomata; and Link, in 1919, collected ninety-one cases, thirteen of which were sarcomata.

As to the symptoms of heart tumours Hirschfelder says that clinically the presence of a tumour in the heart in itself exerts little influence, unless, as in a case of sarcoma reported by Luce, it presses upon the auriculo-ventricular bundle and produces heart-block, or it is so situated as to produce either stenosis or regurgitation at a valvular orifice. E. Meroz, writing in 1917 on primary tumours of the heart, reported one case of a spindle-celled sarcoma that was primary in the heart, and he gives a brief summary of the literature on primary cardiac growths. He also says that if the tumour occupies a position which does not interfere with the heart's action, it will not set up any morbid phenomena; but if it occludes the cardiac orifices, then symptoms of stenosis or insufficiency will arise. The only symptoms noted have been disturbances of the venous circulation.

The most complete article we have found on the subject of sarcoma of the heart is one by Dr. I. Perlstein, of Chicago, published in 1918. He gives a clinical description of all the reported cases and the references thereto, and adds a case of his own.

He says in the opening paragraph of his article

that tumours of the heart have never been diagnosed in the living patient, as a review of the literature shows. He adds that the first sarcoma of the heart was reported by Bodenheimer in 1865, and since then only twenty-nine were reported up to 1918. As to symptoms, Perlstein says: "That a clinical diagnosis of tumour of the heart has never been made can be explained by the fact that this pathological condition does not produce a characteristic picture. Frequently these patients do not present any, or very few, symptoms suggesting cardiac trouble. Some die suddenly and without having shown any signs of the disease, and the cardiac tumour is then found on the autopsy table as a surprise. In some cases the symptoms appear suddenly and death occurs in a short time." He further reports what we have already quoted from other writers as to the symptoms depending upon the location and the size of the cardiac tumour.

In his conclusions Perlstein says: (1918)

"1. Only thirty cases of sarcoma of the heart were found after a careful search of the literature. To these is added a case in which the tumour originated apparently in the sub-epicardial areola tissue. 2. There is no characteristic clinical picture for the condition. The symptoms are mostly those of a seriously disturbed cardiac activity. Excessive and repeated haemothorax was the most striking clinical feature of the cases reported. 3. Sarcomas of the heart occur at all ages, but are most common in the vigorous years of life. 4. Histologically all types of sarcoma have been reported. The spindle-cell variety is the one most frequently found. 5. They occur more often in the auricles than in the ventricles, and more frequently on the right than on the left side. 6. Among the postmortem findings, pericardial and pleural effusions and oedema are common."

A NEW CYSTO-URETHROSCOPE FOR EXAMINING AND OPERATING ON ANY PART OF THE URINARY TRACT BY DIRECT-TELESCOPE OR INDIRECT—PERISCOPE METHODS*

G. S. Gordon, M.D., C.M.

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CYSTOSCOPES and urethroscopes of numerous makes and designs on the market today are so nearly perfect in construction, that one must be very sure of one's ground before offering to add to their number. The one thing lacking so far is, that no single instrument takes the place of all the others required for complete urethral, cystoscopic or ureteral work.

This instrument needs to be inserted only once for no matter what examination or operating is to be done; it can be used with a telescope or a periscope without withdrawal and reinsertion; it reduces the total number of working parts and simplifies them; it allows stronger instruments to be used; and withal, which has been most difficult of attainment, the instrument, it is hoped, is as good as the best for any use to which it is put. This balancing of the different requirements of the combined instrument so that it does not degenerate into a make-shift for some purposes while excellent for others is what has taken up time and experiments for the last ten or twelve years.

During this period others working independently have brought out improvements similar to those incorporated herein. There is hardly any part of the instrument which, in some form or other, is not on the market somewhere; *e.g.*, Geringer's endoscope perhaps the most perfect of its kind to-day, came out while I was using the same principle in a model which is still doing daily duty; the ureteral meatotome, I am informed, is much the same as one in use in Italy; and, finally, the straight heavy instruments to be

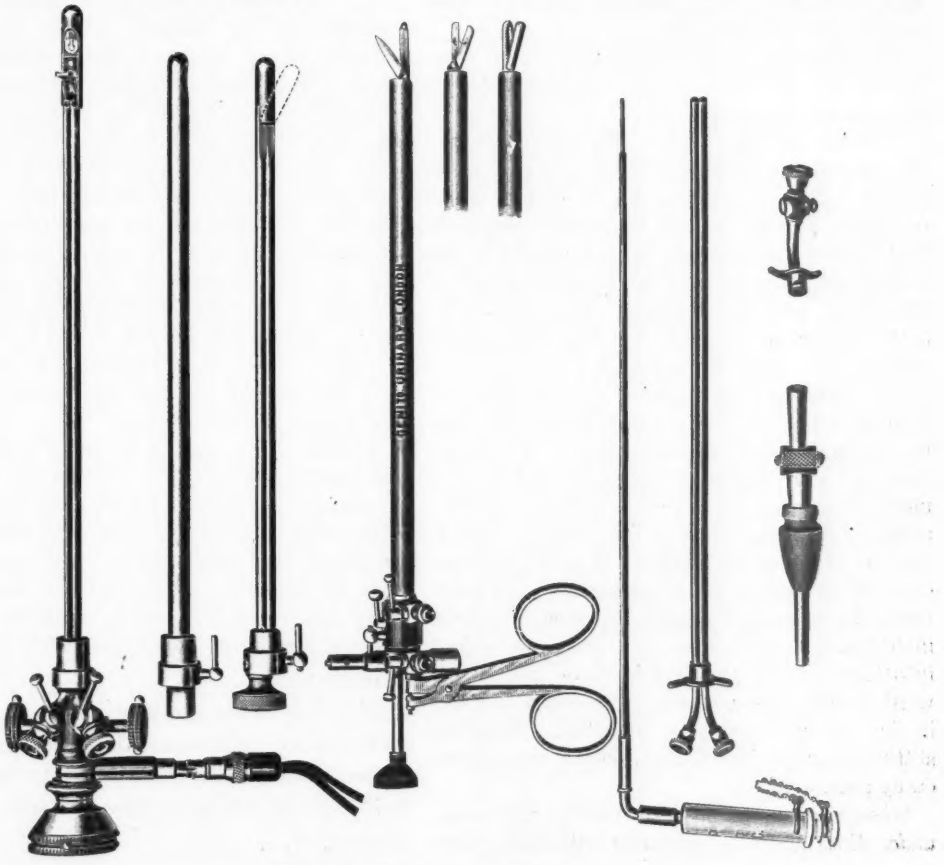
*Presented at Canadian Medical Association Meeting, Winnipeg, June 23rd, 1922.

used with the telescope are on the same lines as the Papin operating cystoscope which was manufactured, perhaps as long ago as when I first began to use this principle.

The introduction of any instrument into the bladder is accompanied by more or less discomfort which sometimes amounts to pain requiring a local or general anaesthetic to control. Often the least instrumentation possible is called for. It is even questionable at times whether it is advisable to cystoscope at all so much harm may be done by cystoscopy. Therefore, there is a call to-day for an instrument with which one can accomplish the maximum at one sitting.

Those who have used the wiggly tools supplied with all operating periscopes will appreciate this system which allows larger, stronger, and simpler ones to come directly into the field of vision by a single thrusting movement.

This cysto-urethroscope is housed in a tube of 24 calibre (French) to introduce which through the urethra into the bladder an obturator with curvable beak is used. Straighten the beak, withdraw the obturator and leave this sheath in place. The urine escapes. Insert the irrigating nozzle into the tube up to the rubber stopper and fill the bladder. Withdraw the irrigating nozzle to drain the bladder, if it is foul, and repeat filling and emptying the bladder until the outflow is clear. Lastly keep the bladder filled with clear solution, by holding the left thumb over the outlet of the sheath. The right hand lays aside the irrigating nozzle, takes up the periscope and carries it quickly and smoothly home in the sheath (the left thumb having been re-



GORDON. CYSTO-URETHROSCOPE

A pleasant surprise awaits those who have not used the open ended, water dilating posterior endoscope. Through this not a patch of the urethra only, but the whole circumference is seen in a field large enough to embrace both abnormal and normal areas, so that any lesion present contrasts with its environments.

moved at the last moment). Should too much fluid have escaped in this manipulation leaving the bladder insufficiently distended, or should one prefer to have a stream of fluid flowing constantly and directly over the field of vision while cystoscoping, insert the tip only of the irrigating nozzle into the small rubber tube attached to the open side tap. Should the bladder get too full during manipulations turn off the inflow and loosen the periscope in its socket sufficiently to allow the superabundant fluid to escape. The periscope is used for examining, for catheterising the ureters, or for fulguration.

The light will be found good, the field large and clear and the catheter carrying tubes of ample size to carry number sixes.

The periscope, having served its purpose, is removed and, if required, the telescope takes its place in the sheath.

Through the tap, fluid is allowed to flow and lift the collapsed bladder off the open end of the sheath. Then the trigone can be seen *en profile* or *en face* at will. It will be found occasionally that ureters which cannot be catheterised by the indirect periscope method can be catheterised by the direct telescope method. The direct telescope method is also used if a very large single catheter or sound is to be passed.

The telescope has soldered to its sides the lighting apparatus and a return water tube (the use of which is to be explained later). Under the telescope and capable of backward and forward movement, may be inserted catheter carriers, scissors, forceps, ureteral meatotome, utricle syringe, or a hook for removing filiforms, hairpins, etc. When one of these accessories is in place under the telescope it practically forms part of the instrument so that when one brings an object into the centre of the field of vision only a forward thrust of the accessory is necessary to bring it in contact with its objective. Shearing, slitting, grasping, insertion or injection then can be easily accomplished.

When used in the posterior urethra the scope, *under direct vision*, is gradually withdrawn from the bladder, care being taken that distending fluid, under a few feet of pressure, is continually flowing through the sheath to dilate the internal sphincter and posterior urethra. The amount of distention can be easily regulated by the height of the irrigator and by the tap on the side of the sheath. If the bladder, into which the distending fluid has flowed, gets uncomfortably full, it is to be emptied by carrying the scope back into it, closing the tap and loosening the telescope in its sheath. Resocketing the telescope, and reopening the tap permits renewed examination or work on the posterior urethra. The scope can usually be carried back and forth in the posterior urethra, if distention is kept up, with only slight discomfort to the patient. Bullae, papillomata, sinuses, ulcers, congested areas, distortion from scars or adenomatous bulgings, inflammation of the utricle, stricture etc., can be all clearly differentiated, when present, through this form of endoscope and remedial instrumentation done where indicated. Finally, on withdrawing it through the external sphincter, the scope can be used as an anterior endoscope, by making use of the extra tap as an evacuator of the distending fluid. Pressure in the anterior urethra can be regulated by manipulation of the inflow and outflow taps.

Thus at one sitting, beginning at the bladder and working out, one can examine or operate on any part of the urinary tract.

I think the irrigating nozzle is worth calling attention to; it can be used with any irrigating cystoscope to carry fluid directly through the main tube or through the taps at will. It will be found very useful where large quantities of fluid are required to flush out and clean a very dirty bladder quickly or to flush the field of vision under direct observation when cystoscopy is under way.

The Cystoscope presented to-day is one of half a dozen being made throughout, under my personal supervision, by the G. U. Mfg., Co., Ltd., of 66, Margaret Street, Oxford Circus, London, W. 1.

TETANUS

JOHN W. S. MCCULLOUGH, M.D., D.P.H.

Chief Officer of Health, Province of Ontario

THE report of the following case of tetanus abstracted from the December 22nd, 1922, number of the *Journal of the American Medical Association* (Goler and Reitz) is of sufficient interest to warrant perusal.

"E. W., a man, aged 27, with a negative history, had a root filling put in a tooth, January 3rd, 1922. January 15th, the neck became stiff, and he was unable to open his mouth. On the 16th, he began to have tonic and clonic spasms, involving all the muscles of the body, particularly the extremities and abdomen. Thirst increased, sweating became profuse, and there was great irritability. On the 19th, 11,000 units of tetanus antitoxin were given subcutaneously by a local physician. January 22nd, he was removed to the Park Avenue Clinical Hospital, Rochester, where a diagnosis of tetanus was made. The spinal canal was tapped, and he was given 4,000 units of tetanus antitoxin intraspinally, 11,000 intravenously and 20,000 subcutaneously. The filling was immediately taken from the dead tooth, which was extracted on the following day. He was given 200 c.c. of a 25 per cent. solution of magnesium sulphate subcutaneously and morphin as necessary in one-fourth and one-half grain doses. January 25th, 26th and 27th, he was given tetanus antitoxin subcutaneously, 10,000 units each day. On the 24th, his tonic spasms had become less frequent, the muscles of the abdomen and the extremities began to relax, the jaw could be more widely opened, thirst was not so constant, and sweating was less profuse. From this time on, the patient made an uneventful recovery."

The same article calls attention to papers by Park and Nicoll, and by Meltzer, published in Vols. 63 (page 235) and 66 (page 931) of the same Journal.

The former of these articles emphasizes the value of repeated intraspinal injections of tetanus antitoxin in conjunction with its use intravenously and subcutaneously. The latter one calls attention to the inhibitory action of a solution of pure magnesium sulphate used subcutaneously. The author summarizes the plan of treatment of cases of tetanus as follows:

"The best general plan for treatment of tetanus would seem to be as follows:

In each and every case of tetanus, 1.2 c.c. of a 25 per cent. solution of magnesium sulphate should be given by subcutaneous injection three or four times a day throughout the entire disease. When the disease is complicated by severe tetanic attacks, 1 c.c. of a 25 per cent. solution for every 10 kg. (20 pounds) body weight (in adults) should be given by the intraspinal method. When the disease is attended by immediately dangerous tetanic complications, from 2 to 3 c.c. per minute of a 6 per cent. solution of magnesium salts should be given then by an intravenous injection until dangerous symptoms subside or the respiration becomes shallow or too slow.

When the respiration seems to become impaired in consequence of the administration of magnesium salt by the intravenous, intramuscular or subcutaneous methods, calcium chlorid should be injected in the manner described above. It is advisable to have at hand an apparatus of intrapharyngeal insufflation ready for use, whenever the respiration becomes slow or shallow.

Finally, the simultaneous treatment by antitetanic serum should not be neglected."

Result of Decompressive Trephining.—Anschütz finds that palliative trephining accomplishes nothing with quickly growing tumours and very high intracranial pressure of long standing. Some benefit is derived with slowly growing malignant processes. The results are very good in benign or stationary malignant processes, if we operate early.—*Deutsche Med. Wo.*

INDUSTRIAL MEDICINE*

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WE are living in what has been termed "the machinery age" and there are no problems of more vital importance to the existence of our present civilization than those concerned with the industrial units of society. It is becoming increasingly apparent that the only way in which man's estate can be improved is through the adjustment of the working environment to the worker and, in so far as may be possible, the adaptation of the workers themselves to the new conditions of employment. These adjustments and adaptations present to Universities most unusual opportunities to extend the scope of their influence and usefulness.

In 1918 a group of citizens of the city of Boston and its immediate vicinity, recognising these great needs and opportunities, made possible the establishment of a course in Industrial Medicine at the Harvard Medical School. The experience of Harvard not only demonstrated the exceptional value of this instruction but also showed the need for more extensive programmes of study. Consequently, when Harvard University received a generous endowment in the summer of 1921, it greatly broadened and extended its facilities for the training of an industrial medical personnel, and this Department is to day rendering inestimable service to industrial establishments and workers throughout the country. There are at present in the United States some eighteen colleges and Universities which give special instruction in industrial medicine and it is a matter of the greatest moment that the governing authorities of Canadian universities should be actively interested in this means of conserving the human resources of Canada which, from the standpoint of its industrial importance, ranks fourth among the members of the League of Nations.

In connection with the modern conception of the purpose of industry, it is apparent that one of the most important functions of industry is the improvement of living conditions in the life of the race struggling for existence and the recognition of this truth is to be found in the activities which business concerns are undertaking for the advancement of the comfort, health and happiness of their employees. Less than twenty years ago it was thought that there was but one fundamental factor in industry—production—but farsighted employers have come to realize that there is another which is equally essential—and this second factor is the personnel. It is fitting in this connection to lay emphasis upon the fact that despite all improvements in labour saving devices, the human machine will ever remain the most vital and indispensable mechanism in the production of industrial wealth. Early in the Great War, the British Prime Minister remarked that it was impossible to make an A-1 Empire out of a C-3 population and it is equally certain that our great Canadian industries cannot maintain their place in the world's competition unless their employees are in good physical condition.

It is unfortunately a fact that medical teaching and medical practice have not kept up with the industrial organization of society and colleges and universities have only very recently recognized their obligations to industry and industrial workers by establishing courses of instruction in Industrial Medicine. The requirements of industrial medical practice are such that the physician in industry must be conversant with the fundamentals of industrial relations, plant organization and operation, safety engineering, employment psychology and methods, fatigue problems, industrial toxicology, sanitation, housing, pension plans, social insurance, recreational activities, etc., in addition to those matters directly related to medicine and surgery. He must be prepared to assume responsibility in connection with the prevention as well as the cure of disease and have a true conception of the obligations of industry to its workers and through them to the community and the nation.

In the ultimate analysis, the degree of success attending industrial health programmes will depend in no small measure upon the industrial physicians who are responsible for their organiza-

*Abstract of Introductory Lecture on Industrial Medicine, McGill University, Montreal.

tion and administration. It is obvious that it is to our Medical Faculties that business concerns should be able to turn, not only for adequately trained industrial physicians, but also for advice and counsel relative to the establishment of industrial health services. The physician in industry must have special instruction in order to better prepare him for his place in the existing order of society and the object of Industrial Medicine should be to make of him a social and medical engineer as well as a physician, to place at the disposition of industrial workers the best technical skill and to stimulate generally a greater interest in and a deeper appreciation of this important branch of preventive medicine from the standpoint of its social, economic and scientific aspects.

Industrial methods are classified as: (1) Domestic production; (2) Handicraft production; (3) Modern Factory system.

Domestic production in its purest form presupposes the absence of exchange and the ability of each household to satisfy by its own labour the wants of its members. Handicraft production is carried on within or outside the house, usually by free workers; the region of the sale is local—that is, the town and its immediate vicinity. The modern factory system supplies the economic wants of individuals, communities and nations by wholesale production and the aid of machinery and motive power in specially constructed plants operated by industrial wage earners.

Factory organizations vary greatly in the number of divisions or departments and in the size of the administrative and operating units, but the underlying principles are fundamentally the same in all instances. Whether the employees number 50 or 50,000, the aspects of the system fall into three separate and distinct categories. These may be defined as (1) organizational, which is concerned with the human and financial factors; (2) technical, which relates to the physical factors; (3) functional, which has to do with performance.

Let us now consider the functions and relationships of Industrial Medicine in the existing order of business affairs. A complete industrial health programme embraces activities which have been divided by Mock into two groups: (1) those directly concerned with health supervision, and (2) those which are adjuncts or auxiliaries. Under the former are the medical, surgical, dental, nursing, safety and sanitation services; while in the second group are the employment, restaurant, recreation, welfare, insurance, pension, loan, housing and community services. It is important, at this point, to emphasize that there should be nothing about industrial health work that savours of paternalism or philanthropy and later on I shall discuss both its tangible and intangible values. However, I wish to say here that its economic soundness has been proven beyond all question.

Before taking up this phase of the subject, I wish to tell you briefly about a few of the more important subdivisions of industrial medical practice. Let us consider first, accident prevention, which is a function of the Safety Service. Accident prevention in Canada is still in its infancy, whereas in Switzerland, Germany, and to a certain extent in England, the problem has long been of national importance. These governments have their official experts studying accident prevention from every angle; new laws increasing the safety of industrial workers are enacted almost every year; there are inspectors who investigate and enforce the laws; school children are taught accident prevention and colleges and universities give special courses in the subject. In a word, every means to engender a national spirit of prevention is employed. Not only should every effort be made to prevent accidents, but also, the restoration of an injured employee should be considered as being both a moral and an economic responsibility. Experience has shown that unless the officers of an industrial establishment become personally interested in accident prevention, progress in this work will be very slow. On the other hand, all safeguards, all rules, all discipline and all other safety efforts must fail without the willing and earnest cooperation of the workmen themselves.

In passing on to the consideration of Industrial Medical Services, one finds that, in addition to those matters directly related to medicine and surgery, they are ordinarily concerned with a variety of functions and interests, among which may be mentioned: Physical Examinations, Personal Hygiene, Health Education, Plant Sanitation and Occupational Research. In connection with the physical examinations, it cannot be emphasized too strongly that they are not a scheme either for weeding out employees who are beginning to wear out or for depriving handicapped applicants of a chance to get a job. As a matter of fact, the only reasons for rejecting an applicant for employment should be three: (1) when it would be a source of danger to himself, (2) to his fellow workers, or (3) to property.

The value of a healthy working force to any concern requires no comment and the benefits of these examinations to the employees are beyond all question, since through them, threatened disease is discovered while it is still preventable or at least curable, conditions are detected which make the employee prone to accidents or to cause accidents to others, the working force is protected from communicable diseases, mental or physical handicaps constituting a health hazard are brought to light, both temporary and permanent incapacity is reduced, the amount of wages lost on account of illness is cut down, and the cost to employees of their health insurance is greatly diminished.

From the standpoint of personal hygiene, the needs of each employee are discovered through the physical examinations and the necessary instruction is given to meet the individual requirements. Among industrial workers, the matter of personal hygiene merits the most careful consideration and is a factor of the greatest economic importance. In fact, those employees who are most receptive to the hygienic principles of life and work are rewarded for their efforts by enjoying the highest reaches of working power and all that it implies from the standpoint of financial returns and advantages. The success of industrial health work will be proportionate to the extent of the development by the workers of a higher sense of responsibility for the care of their bodies and since this is true, health educational activities must not be neglected. Whatever the methods employed in the dissemination of health information, the industrial nurse is the one outstanding and indispensable factor in any comprehensive plan for the presentation and application of the basic facts about correct and healthful living.

The problems concerned with plant sanitation are among the most fundamental with which Industrial Medical Services have to deal and it is the duty of every physician in industry to improve the sanitary conditions in his plant to the end that the workers will have the greatest possible protection, the company will receive the greatest possible benefits from the improved conditions and the sanitary standards of the plant will serve as a model for others. It is not intended that the industrial physician shall supplant the sanitary engineer but it is expected that every physician in industry will have some knowledge of the essential principles of sanitation and that there will be the closest cooperation between industrial physicians, sanitary engineers and operating managers in making and keeping shops and factories sanitary and healthful.

In connection with occupational research, Industrial Medical Services may render great assistance to Employment Departments by studying the factors concerned with the mentality of the worker, his physical status, the conditions of work and the working place, the materials, processes, etc., so that employees may be placed in positions which will not be prejudicial to their health.

There is one other matter that should be included in a discussion of industrial health services. I refer to the question of group insurance. The two main divisions of group insurance of interest to industry are group health and group life. The former provides weekly sick benefits for any incapacity or disability for which no compensation is payable under the Workmen's Compensation Act and the latter provides for the employee's dependents in case of death and for the employee and his family should he become totally and permanently disabled before he is sixty years of age. By means of group life insurance, for which, by the way, no medical examination is required, it is possible for employees to secure protection for about half of what it would cost them as individuals in the open market; older employees who are practically uninsurable on an individual basis are taken care of and when illness comes along or death occurs there are funds available without it being necessary to "pass the hat." From an economic standpoint, group insurance does not constitute a great expense and there are very few ways that employers and employees can combine forces to greater mutual advantage.

Before considering the tangible and intangible values of industrial health work it is important to briefly mention the relations of industrial physicians and private practitioners. Unfortunately, there is a tendency on the part of many private practitioners to view with alarm the growth of Industrial Medicine. Just why this should be, it is difficult to understand because experience has amply demonstrated that properly administered industrial health services advance both the professional and financial interests of doctors residing in communities where such work is carried on. Industrial physicians are, in fact, collaborators rather than competitors. They do not deal with conditions of non-industrial origin:

and with the full regard for reciprocal rights which should prevail among all ethical physicians and a better understanding by private practitioners of the functions of Industrial Medicine, harmonious and mutually helpful relations between physicians in industry and their colleagues in general practice will most certainly be established and maintained.

Since it is becoming more and more apparent that the health of the industrial worker is the hub of the wheel of industrial efficiency, it is quite natural that both employers and employees should take an increasingly greater interest in the fundamental and economic soundness of industrial medical practice. The intangible values of the work are undoubtedly much more important than those which may be estimated in terms of dollars and cents. It is obvious that increased efficiency will result from the discovery and treatment of disease, that accident prevention is better and cheaper than compensation for disability, deformity or death, and that a happy, healthy and loyal working force means greater production; but no one can hazard even an approximate guess as to just how much all these factors amount to in terms of monetary values. On the other hand, there are a number of tangible factors, such as lost time percentages for various causes, to which fairly definite financial equivalents may be assigned. Judge Elbert H. Gary, of the United States Steel Corporation, speaking before the New York Board of Trade last October, made the following statement: "During the last ten years we have expended over $100,000,000 for welfare work alone. One might say without much thought that this is a pretty liberal expenditure of money for welfare work and that, perhaps, stockholders should have a right to say something about it and insist that the money be saved and paid out in dividends on the stock. But then along comes the thinking man, the man who has experience in this particular subject and who takes a broad view of things. He will give an answer which, to my mind, is absolutely convincing in favour of the expenditures suggested. It is this: It pays in dollars and cents, as a net result, in profits during the year, to make the most liberal expenditures in protecting the lives and persons of employees." Now, Judge Gary knows whereof he speaks and, in passing, I may add, just to mention a single item, that his organization has reduced its accidents by 62½% in the past fifteen years.

When the statement is made that industrial health work pays, it must not be assumed that the Company is the sole beneficiary. The fact is that industrial health programmes are a good investment because both employers and employees profit by them. In the ultimate analysis, the proposition may be reduced to the following simple formula: Industrial health work must be advantageous to both employer and employee if it is to succeed and economically sound if it is to last. Otherwise expressed, its permanence will depend upon its dollars and cents value and its effectiveness upon the degree of co-operative effort. The 1922 statistical and financial records of the Laurentide Health Service show a substantial monetary return to the Company and an even larger additional dividend to its employees; furthermore, taking into consideration only the more tangible values, there was a financial equivalent in service of $1.20 for every $1.00 of net expense to the Company. There is every reason to believe that Industrial Medicine is destined to fill a place of commanding influence in the existing order of society, while to the physicians in industry there is open a most unusual range of interests in behalf of national progress and human betterment.

Births during War Time.—David (Zentralbl. f. Gynäk., May 20th, 1922), from examination of children born during the war at the Universitäts-Frauenklinik in Budapest, where from 1,400 to 2,000 births take place annually, concludes that neither stillbirths nor premature births increased during the war. The proportion of male to female children did not vary from that obtaining during peace. No increased mortality among the newborn was perceptible. The average weight was found to be diminished during war time, especially during the last three years; the average dimensions also showed a decrease, which was about three per cent. in length and one per cent. in the circumference of the head. These diminutions were not traceable to a shortening of the average duration of pregnancy.

Case Reports

A CASE OF SEPTIC ARTHRITIS IN AN INFANT

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Baby H—, three weeks old was brought to the Children's Memorial Hospital suffering from a swelling in upper half of left thigh. She was a full term child who had been breast fed until the day of her admission. On the night before, the mother, when changing the child's diapers, first noticed a swelling about the left hip. The mother had never noticed that the child had been feverish, although the infant had been restless and fretful for three or four days before admission, but had slept well until the night of its admission. The mother thought the swelling was increasing in size.

On examination a large swelling in relation to the upper half of the left thigh was found. The swelling was very tense; the skin over it was of a purplish red hue and the venules appeared to be increased in number and much dilated. The tumour, tense and solid, suggested a deep seated collection of fluid although fluctuation could scarcely be elicited. The temperature of the infant was normal.

In considering the diagnosis a deep seated haematoma in one suffering from an angioma was considered to be the more probable cause of the swelling than a deep seated collection of pus due to a septic arthritis following an infection of the respiratory tract or of the navel. This diagnosis was preferred because the patient's temperature was not above normal, the skin, as already pointed out, was covered with a mesh-work of dilated venules and the onset had been sudden in a child whose surroundings were not of the best. Further, there was no indication of any infection about the umbilicus and there was no history of any naso-pharyngeal or bronchial affection. On the other hand, the incidence of this condition at the third week was very suggestive of an infective arthritis.

In order to clarify the diagnosis it was suggested that a needle should be inserted deep down into this mass. A protest was registered against this, however, by a physician who stated that if this tumour should prove to be a haematoma as had been suggested some difficulty might be experienced in stopping any haemorrhage which might result. Doubt, however, was soon removed by a sudden rise in the patient's temperature and an acceleration of pulse. This, taken in conjunction with the fact that the patient's general condition was not improving, forced the suggested exploration by means of a needle. Pus was found and a large quantity evacuated. A deep incision was then made. Through this it was found that the seat of infection was in the hip joint which was opened and a drainage tube inserted. The child lingered for a few days but then succumbed to the infection.

An arthritis due to septicaemia, of which the primary focus is in the cord or respiratory tract, generally begins about the second or third week. The joints which are most frequently affected are the knee, the ankle and the hip, although the shoulder, the elbow and the wrist may be affected. If the source of infection is in the cord the streptococcus is usually found to be the etiological factor but, if, on the other hand, the primary lesion is in the respiratory tract, no matter how mild this primary lesion may be, the organism primarily responsible for the lesion from which the patient suffers, is most frequently the pneumococcus. The prognosis in all cases is bad. The mortality is at least seventy-five per cent. This high mortality is due, not so much to the surgeon's inability to drain the joints affected, as to the fact that in the majority of these infants the process is a general infection; the arthritis is simply a manifestation of this condition. Septicaemia in these young children, whose resisting power is low, causes their death in spite of all surgical procedures.

Retrospect

CONGENITAL HAEMOLYTIC JAUNDICE*

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Jaundice may arise in three different ways: first, from any obstruction to the outflow of bile from the biliary tract, an *obstructive jaundice*; second, from a rapid destruction of red blood cells with a consequent increased liberation of blood pigment, a *haematogenous or haemolytic jaundice*; and third, from a combination of these two processes, which is the usual condition met with in the jaundice of the acute infections.

As a general rule jaundice is merely a symptom of some underlying disease, but in certain cases no causative agent can be identified, and the disorder shows such a constant picture, that we may speak of it as a disease entity. Such a condition is met with in congenital haemolytic jaundice, which recently has been made the subject of an excellent monograph by Wilder Tileston[1].

Congenital or familial haemolytic jaundice was first described as a separate disease by Murchison, in 1885, more fully investigated by Minkowski, in 1900, but it remained for Chauffard to identify, in 1907, the two additional characteristic features, the marked increase in the number of reticulated red blood cells, and the great fragility of the red cells when exposed to haemolytic agents. In the same year Widal identified an acquired haemolytic jaundice, but the large majority of the cases are of the congenital or familial type.

In many ways the course of the disease is very like that of pernicious anaemia, another haemolytic disorder; it is one of crises followed by periods of remission, but the disease is not a fatal one, many of the cases living to the fifth or sixth decade. As a rule a crisis follows some acute infection or upset, the patient vomits much bile, the spleen enlarges and becomes tender, and there may be a great increase in the degree of the anaemia present. After a variable period there is a recession of symptoms and the patient goes on as before the crisis.

In the congenital type the family history is always of interest. Enlargement of the spleen, anaemia and low grade jaundice can usually be found in many members of the family[2], and can often be traced through three or four generations. There is no sex factor in the transmission of the disease, as is the case in haemophilia, males and females being affected in almost equal numbers.

The jaundice may be present from birth or may appear in early adult life following some acute infection, but once established it usually persists throughout life. There is no sign of obstruction of the bile passages, the stools contain greatly increased amounts of bile pigment (urobilin), while the urine is free of the usual bile pigments. Signs of cholaemia, (itchiness, bradycardia, etc.) are absent and the skin is of a lemon yellow tint, as seen in pernicious anaemia, never the bronzed colour which characterizes any long continued jaundice of obstructive origin.

The spleen is enlarged, is often tender, and during the crises it may reach the level of the umbilicus; on the other hand the liver shows only a slight increase in size.

The blood is of particular interest, as most of the clinical picture is built up around an increased destruction of the red cells. The anaemia is of moderate degree except during the crises, when the count may drop from the usual three and a half or four millions to one million or below, in a surprisingly short time. The colour index is high, as in pernicious anaemia, and the cells are irregular in size but not in shape. The characteristic feature, however, is the increased fragility of the red cells to hypotonic salt solution. In normal blood the red cells begin to haemolyse when the salt solution is diluted to 0.48—0.44 per cent., and haemolysis is complete when the dilution reaches 0.3 per cent. In haemolytic jaundice this change commences at 0.6 per cent. and is complete at 0.4 per cent., an evidence of a marked lowering of resistance on the part of the red corpuscles. The plasma plays no role in the haemolysis, because washed corpuscles show the same increased fragility. The second interesting feature becomes apparent when the blood is stained with brilliant cresyl-blue. Normally not more than one per cent. of the red cells show reticulation, while in the haemolytic jaundice ten, twenty or

*Read before the Osler Reporting Society, November, 1922.

even fifty per cent. of the cells may show this "vital staining" reaction. This reticulation is seen only in youthful cells, and is an evidence of active regeneration, but it has been shown that these young cells are not more fragile than the older non-reticulated forms. The white cells are not disturbed in any regular way, and there is no change in the differential count. The plasma does not show any increase in haemolytic activity over that seen in normal individuals.

The urine is highly coloured, due to the presence of excessive amounts of urochrome which is the normal urinary pigment. This substance is closely allied to urobilin which is also present in large quantities. The stools are never clay-coloured, indeed they often contain from ten to twenty times the normal amount of urobilin, thus giving evidence of the severity of the blood destruction.

Studies of the metabolism show a marked increase in the excretion of iron, and moderate increases in the total nitrogen and endogenous uric acid, but the metabolism of the fats is not affected. The blood cholesterin is of particular interest because of its anti-haemolytic action, but Windaus has shown that there is no lowering of cholesterol either in its free form or as cholesterin-ester. Cholesterin studies have an added interest in view of the frequency of gall stones in this disease. Mayo reports their presence in fifty-eight per cent. of his cases.

The cause of the disease is still unknown. Chauffard has suggested that in many cases the disorder is associated with congenital syphilis and with tuberculosis, but the uniform lack of curative action of salvarsan and the failure of careful study to demonstrate any syphilitic or tuberculous focus in the spleen after its removal, would seem to rule these out as causative agents. All that can be said is that it is a disease in which a diminished resistance of the red cells to haemolytic agents is an important factor, and that the spleen is a necessary link in the production of the haemolytic features of the disease, as is shown by the virtual cure which follows the removal of this organ. That a perverted function of the spleen is not the sole cause of the disorder is shown by the persistently increased fragility of the red cells which remains in a majority of cases even after splenectomy.

The pathology of the disease is of distinct interest. The spleen is markedly enlarged, due chiefly to an intense congestion of the sinuses rather than to any increase in the fibrous structures of the organ, and in this it differs entirely from the spleen in Banti's Disease. The liver is not enlarged to any proportionate extent, there are no signs of cirrhosis, but it usually shows a definite pigmentation due in part to deposits of iron in the periphery of the lobules. Siderosis is a marked feature in the kidneys, especially about the convoluted tubules. The bone marrow is red and shows signs of much activity.

The treatment of the disease is surgical; removal of the spleen is followed by a prompt recession of the jaundice, of the excessive urobilin excretion, and of the anaemia. Medical treatment is unsatisfactory.

The prognosis is good if the patient survives the operation, and in skilful hands the operative risk is not great, the Mayos reporting a series of nineteen cases with only one death. Even if untreated the disease rarely causes any serious invalidism, and many of these patients live to late middle life.

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RETURN CASES OF SCARLET FEVER

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WHEN a case of scarlet fever has been discharged from an isolation hospital and carries the infection home, so that other cases occur in the household, these fresh cases are known in hospital parlance as 'return cases.' The term appears misleading and inaccurate but has been widely used in medical literature for the past fifty years. Such return cases are regarded as a reproach to the hospital as being an impairment of the most important function of hospitals for contagious diseases, *i.e.*, to lessen the chance of spread of the diseases in the community. Nevertheless in the case of scarlet fever all hospitals alike seem to provide their quota of return cases. In the Alexandra Hospital, of Montreal, of 500 consecutive cases of scarlet fever discharged this year, nineteen apparently carried the infection home. The published statistics of a commission investigating the English fever hospitals showed

invariably 2% to 5% of return cases. Cases quarantined in private houses show no better results. Dr. Nash, in England, investigated several hundred cases in private practice and found nearly 5% carried infection when released from quarantine.

Many different explanations have been offered of the phenomenon. The official quarantine period of the disease varies widely, from a minimum in Paris of ten days, to three weeks according to the U.S. Government, or four weeks in the Province of Quebec, or five or six weeks in various institutions. The duration of quarantine seems to have little effect on the number of return cases. Dr. Ker, of Edinburgh, watching two large institutions for a considerable period of time found that the one with the longest quarantine period had the largest proportion of return cases. For generations the desquamation was supposed to carry the infection but all the best modern authorities agree that this is a fallacy and the cast-off scales are not infectious. Most writers believe that the infection is carried by various persistent pathological discharges, and it has been suggested that patients leaving a hospital ward, easily contract catarrhal colds which provide infectious discharges.

The most probable explanation is that many scarlet fever patients remain 'carriers' of the unknown causative organism for many weeks or even months. Such carriers are recognized in almost every disease of which the specific organism is known. One need only recall diphtheria, typhoid, cholera, gonorrhoea and many others. It is noteworthy that in such carriers the persistence of the presence of the organism is due to some pathological condition, *e.g.*, chronic tonsillitis favouring the persistence of diphtheria bacilli; hence the importance of pathological discharges as favouring the continued presence of infection in convalescent scarlet fever patients. If this theory be correct we are never likely to prevent the occurrence of return cases of scarlet fever until the organism is known and can be tested for and recognized in each case before discharge.

Many suggestions have been made in recent articles on the best method of lessening the number of these return cases. The most practical ones are the following:

1st—The separation of convalescent patients from the acute cases for at least ten days before discharge.

2nd—That provision should be made for convalescents to get out of doors for several days before their discharge from the hospital.

3rd—That a stricter inspection of all patients for any pathological condition be made the day of discharge.

4th—That all discharged patients should be re-inspected after two or three days for the occurrence of pathological discharges, and if such be found, they should be quarantined again.

5th—That full instructions both written and oral be given the guardians of the discharged patients with advice to keep the patients apart from other children as long as possible.

Finally, it seems advisable to spread a knowledge of the possibility of such return cases occurring as widely as possible among physicians, nurses and the general public, to prevent causeless criticism and unearned reproach to painstaking institutions and individuals, for an occurrence which it is beyond their power to prevent, in the present state of our knowledge.

No Tampons in Incision Wounds.—Chiari explains his method of keeping open such small incisions on the fingers and hand as require it, by suturing the edges of the wound to the adjoining skin. Doubtless many surgeons have used the method, he thinks, but in the thirty cases in which he has used it the past six months the wounds have healed so well without the use of tampons that he thought it might not be superfluous to call attention to the method. To the wounds he applied ointments or sterile gauze, and hot hand baths are given, beginning the day after the incision.—*Jour. Am. Med. Assoc.*, January, 1922.

Editorial

SOCIAL INSURANCE

BOTH in England and the United States there is a well-founded belief that compulsory health insurance is contrary to the best interests of industrial workers and the people at large. Speaking of the English National Insurance Act before the Quiz Medical Society, New York, Sir Arthur Newsholme said: "On the point of equity, it must be admitted that any system of so-called insurance which, like that of the English Act, excludes a large proportion of the population who, while paying taxes in aid of the insured, require but do not receive their benefits, is contrary to the principle that any expenditure of Government funds should enure to the whole community in need of the provision in question."

Careful study of the question of compulsory health insurance brings out two rather astonishing facts: (1) that, fundamentally, the plans which are now in force are not systems of *insurance* but measures of *arbitrary taxation;* (2) that social insurance in the ultimate analysis and at best can be nothing more than a useful handmaiden to Public Health. It is not our purpose to enter into a technical discussion of the principles of social insurance but rather to present a practical working plan whereby industrial wage earners may enter into a cooperative agreement with employers and receive protection against sickness and death while economists and politicians are discussing the theoretical pros and cons of this most vital problem.

The two main subdivisions of social insurance which are to be considered are group life and group health. A study of claim figures in the United States indicates that as high as 40% of the wage earners have no life insurance and the direct and indirect relationship between illness of the bread winners and destitution requires no comment. By means of group life insurance, for which, by the way, no medical examination is required, it is possible for employees to secure protection for about half of what it would cost them as individuals in the open market; older employees who are practically uninsurable on an individual basis are taken care of and if permanent disability takes place before the age of sixty, or if death occurs at any time, there are funds available without it being necessary to "pass the hat." Group health insurance provides weekly sick benefits for any incapacity for which no compensation is payable under Workmen's Compensation legislation. Now experience has demonstrated that it is a sound economic proposition for employers and employees to combine forces in connection with these matters—in fact, it is doubtful if there are many ways in which they can cooperate to greater mutual advantage.

During 1922 a well known Canadian industrial organization carried on such a plan and the following figures are taken from the annual report:

Total amount of life insurance under the group contract, $2,056,788.70,

Number of individual policies, 1,083,

Total amount of sick benefits paid, $9,447.26,

Total payments for death and permanent disability claims, $21,048.00.

The premiums and overhead charges amounted to only $36,370.58 and were shared by both employer and employees. Among the employees there were more than 125 who could not have purchased life insurance at any price as they were uninsurable on an individual basis, and this cooperative group insurance plan produced, not only in these instances but also among the working force generally,

a reaction which was translated into terms of greater loyalty, greater contentment, greater cooperation, greater production; and less absenteeism, less labour turnover and less operating expense.

When one reads the innumerable articles that have been written about social insurance and then considers the practical simplicity of the cooperative effort herein outlined, there comes to mind that excellent work of Herbert Spencer on quite another subject: "The Murder of a Beautiful Theory by a Gang of Brutal Facts." B. L. WYATT

ABILITY IN CHILDREN

IN the *British Medical Journal*, February 25th, 1922 the work of Mr. Cyril Burt, psychologist for the schools under the jurisdiction of the London County Council, is discussed. When intelligence tests are being so frequently used in all branches of society to-day and are being discussed by everyone, it is well to see such an article in a medical journal pointing out the weaknesses of such tests. Not that these tests are absolutely condemned but it is pointed out that perhaps there has been a too liberal translation of the tests from the French originals. In this respect Mr. Burt has evidently not been using the Terman revision of the Binet-Simon tests as in this revision this objection has been removed. "The school examination is a fair test of knowledge of school work, but it is a poor measure of capacity, and ignorance of school learning is no proof of defect. The argument, that where attainments are meagre ability must be low, is fallacious. Poor health, poor homes, irregular attendance at school, lack of interest in the subjects of instruction, want of will to learn them, are commoner causes of inability to spell or to calculate than an inherent weakness of intellect or genuine defect of mind. The dull are usually backward, but the backward are not necessarily dull." All this is perfectly true but to many is not known. It has taken the results of school surveys using the intelligence tests to make educationalists really appreciate this fact. In his survey Mr. Burt found some 1.5 per cent. of the school population of London mentally defective. In America the results have been from two to three per cent. In analysing the 1.5 per cent. Mr. Burt found that only one-third of them, or 0.5 per cent. of the grand total of children are so defective as to warrant their being classed as "institutional" cases; one-third will need "supervision," and the other third are only to be reckoned defective owing to the defects of our educational system. These facts could all be applied to any section of Canada. When a child is diagnosed as being mentally deficient it does not mean that he must be placed in an institution. Many mentally deficient children are more trainable than many children with normal intelligence. It is necessary, however, to change our system of education for these children. They cannot be educated in the haphazard manner in which our normal children are being educated. Special classes are needed for them; in these classes these children are taught according to their capabilities. The results obtained by these special classes have been most encouraging. Fifty to seventy-five per cent. of the children graduating from these classes become self-supporting. As regards the intelligence tests themselves it must be clearly understood that the results from these tests are not to be considered the final diagnosis. These tests are not the final word in deciding the cause of a child's backwardness in school. Many factors have to be considered before a child is diagnosed as being mentally deficient. A careful family and social history, a medical and psychiatric examina-

tion as well as a psychological examination should be made of each child. The internist does not rely absolutely on a Wassermann report to decide whether a patient has syphilis or not. Neither can a child be pronounced to be mentally deficient simply on the result of an intelligence test. These tests are simply an aid, a valuable aid, in determining a person's intelligence.

TETANY

THE occurrence of tetany in diverse conditions has long been a puzzle to physiologist and clinician alike. To mention only a few of these; it is seen in infancy, in patients who have had an accidental removal of the parathyroid glands; following the administration of large doses of bicarbonate of soda, in patients with pyloric obstruction; and occasionally following prolonged deep breathing in patients with functional nervous disorders. At first glance it appears impossible to find a common basis for the etiology of this phenomenon in the above-mentioned conditions. A large amount of experimental and clinical work has recently been done with this end in view.

It seems a well established fact that infantile tetany and the tetany following parathyroidectomy depend upon a disturbance of calcium metabolism either primary or secondary. One manifestation of this is the reduction in the calcium concentration of the blood which is found in these types. Probably the body fluids share in this reduction. In both these types the tetany may be relieved by the administration of certain calcium salts. As it is known that the irritability of nerve and muscle tissue is dependent upon a definite ratio between the calcium and sodium salts in the fluids bathing them, it is likely the reduction in the sedative calcium element which causes the tetanic contractions. Paton and his school have attempted to show that "parathyroid" tetany results from an accumulation of certain toxic substances of the purin group, which they claim are normally neutralized by the parathyroid glands. If this be true it is possible that the disturbance in calcium metabolism is secondary to this.

In the tetany following pyloric obstruction there is a definite increase in the alkaline reserve of the blood as measured by the blood bicarbonate (Van Slyke). Following the administration of large doses of soda, especially in patients with impaired renal function, the same increase of the alkaline reserve takes place. In both these groups the calcium content of the blood remains normal. It appears then that tetany may occur in certain cases where the alkaline reserve is increased above a certain level. This gives a warning against the administration of excessive amounts of sodium bicarbonate, which is often administered indiscriminately for the treatment of acidosis. Examination of the urine and where possible, of the blood will guard against such accidents. Both these types of "bicarbonate" tetany may be relieved by the administration of acids such as hydrochloric acid or of other substances which reduce the alkaline reserve of the blood, like ammonium chloride and calcium chloride.

Another peculiar form of tetany has been observed experimentally and clinically following prolonged deep breathing. Grant and Goldman have shown that in this condition a true or uncompensated alkalosis takes place. The calcium metabolism as measured by the calcium content of the blood seems to be normal.

Freudenburg and Gyorgy have advanced the ingenious theory that in "bicarbonate" tetany and the tetany occurring with alkalosis it is a decrease

in the ionized or physiologically active calcium of the blood which determines the onset of the tetanic symptoms. If confirmed this will explain these types of tetany on the basis of a disturbed calcium metabolism. The proof of this will rest finally upon the actual measurement of the ionized calcium of the blood. The methods used for this determination are still imperfect.

LEAD POISONING

AMONG industrial diseases, lead poisoning is one which not only in recent times but in past ages has demanded persistent attention. Until the end of the last century more attention was paid to the treatment of those affected than to the prevention of the ailment. A more recent enquiry into the dangers attendant on the use of paints, lead compounds, etc., has been held by the New South Wales Board of Trade at the instigation of the Minister for Labour and Industry. The report of the Board recently issued is an elaborate document of nearly 800 pages. Among the witnesses who were called before this board were medical practitioners, mining engineers, master painters, and operatives. The conclusion the Board came to was that lead, as used in the painting industry, that is, chiefly as white lead, is a substantial cause of injury and death to painters and other workmen engaged in the painting industry, but that immediate prohibition is not the appropriate remedy for these evils. In the opinion of the Board there is no more reason for the prohibition of the use of white lead in paints than there would be for the prohibition of lead mining or of the mining of other metals found in geological association with lead-containing minerals. "Lead poisoning" being a preventable disease, it would indeed be a desperate situation if the only means of prevention were the abolition of the use of lead. Special stress is laid on the importance of attention to personal hygiene, to a properly arranged dietary, and to the avoidance of intemperance. Employers should be compelled to provide efficient ventilation of factories, and to install suitable washing appliances and supply proper medical supervision.

SEPTIC THROMBOSIS: ITS DIAGNOSIS AND TREATMENT

AT this season of the year, and with the presence in almost every community of catarrhal colds of all degrees of severity the paper read at the last meeting of the British Medical Association on Septic Thrombosis, by Sir William Milligan, *British Medical Journal, September*, 1922, has a very special interest.

Sir William Milligan at the outset emphasizes the fact that the presence of a thrombus in the lateral sinus is in effect an effort on the part of nature to protect deeper seated and more vulnerable structures. The ever varying position of the sinus to adjacent mastoid cells is of more importance in the incidence of disease, than the virulence of the casual organism, which is usually a streptococcus; most frequently the *streptococcus haemolyticus*.

Thrombosis of the mastoid is more likely to occur in the pneumatic than in the diploetic variety of mastoid. The

diagnosis in typical and advanced cases is not difficult. It is in the atypical and latent cases, both by no means uncommon, which present the greatest diagnostic difficulties, and it is in these very cases that an early and accurate diagnosis is most vital. These latter are most frequently met with in children, where no demonstrable symptoms of mastoid infection may be present. An intelligent appreciation and anticipation of the course of pathological events will assist in making an early diagnosis.

Sir William Milligan finds that in his series of intracranial complications secondary to purulent otitis media, thrombosis of the lateral sinus occurs in 50% of cases, while septic meningitis occurs in nearly 60% of cases; both complications tend to be solitary complications. The former is generally amenable to early surgical interference; the latter is almost invariably fatal. The author points out that although septic thrombosis is in the vast majority of cases a disease of neglect and the result of a chronic suppurating otitis media and mastoiditis, it not infrequently follows an acute attack. The involvement of the sinus by direct extension (periphlebitic origin) is more gradual in onset, being limited by a barrier of granulation tissue; it is also more likely to perforate with abscess formation in continuity with the area of suppuration within the mastoid cells. Haematogenous infection (endophlebitic origin) produces few local changes for a considerable time, but gives rise to symptoms more rapidly, and is the more dangerous type.

Of the symptoms, the occurrence of a rigor in any case of middle ear suppuration, is a danger signal of the first importance. The temperature record being one of the most important and reliable diagnostic signs. The swinging morning and evening temperature indicates that thrombosis is in full bloom. In the atypical cases the temperature is a less exact guide, the tendency being for it to be continuously high, rather than remittent. The pulse varies more or less regularly with the temperature. Rigors occur in about one half the cases only, being frequently absent in children, while chills and a feeling of chilliness are present in nearly 80% of the cases.

The author also points out that slight ocular changes occur in 75% of sinus cases. An actual optic neuritis occurring in 30% of the cases. The x-ray offers no assistance in the diagnosis of a thrombus; and blood tests are of little diagnostic value. A leucocytosis is suggestive of pus but not necessarily pus in the sinus or even around it.

In his experience the disease with which sinus thrombosis is most likely to be mistaken, is typhoid fever, simulating this condition very much during the first week. The presence of a Widal and petechiae, the absence of very marked variations in temperature with rigors or chills is, as a rule, sufficient to differentiate. A central broncho pneumonia is differentiated by the persistent cough, rusty sputum and more even temperature. A blood examination helps to distinguish it from malaria.

He states that the value of an early and accurate diagnosis cannot be overestimated and that when reasonable doubt exists, he has no hesitation in performing an exploratory operation, in exposing or actually slitting up the sinus, purely and solely for diagnostic purposes. He has never had any reason to regret having adopted this course of action.

D. H. BALLON

Acidosis in Hyperthyroidism.—Ralph H. Major, Kansas City, Kan., reports two cases of marked acidosis associated with hyperthyroidism of moderate severity, the condition appearing in one instance after roentgen-ray treatment of the gland, and, in the other, following a lobectomy performed under nitrous oxide and oxygen anaesthesia. Both patients responded promptly to the administration of alkali.—*Jour. Am. Med. Assoc.*

Editorial Comment

It has been brought to our attention by the Secretary of the British Columbia Medical Association that negotiations between the Industrial Service Committee of that Association, and the Canadian Pacific Railway Employees Medical Association have reached an *impasse*.

These negotiations have been pending since January, 1922, and the subject at issue is the terms of contract between the Canadian Pacific Railway employees organization and its medical officers.

We have invited the British Columbia Medical Association to prepare a succinct statement for insertion in the correspondence columns of the March issue of the *Journal*.

In the meantime we would strongly advise any medical man who contemplates engaging with the Employees Association in response to recently issued advertisements to thoroughly acquaint himself with the situation before coming to a conclusion.

LETCHWORTH VILLAGE—A MODEL INSTITUTION FOR THE CARE OF DEFECTIVES

This institution is intended eventually to provide for about two thousand persons. It is beautifully situated on the shores of the Hudson River. At Letchworth Village the estate comprises about twenty-one hundred acres, much of which is just as nature made it; the buildings are in small units accommodating, with their dormitories about eighty patients. The buildings themselves are of field stone roughly dressed and made most attractive in appearance; the dormitories are all of one story in height, and are of semi-fire proof construction. They are perfectly ventilated, kept very cleanly and are ideal from every standpoint. An air of happiness is everywhere prevalent. The dormitories and buildings generally are flooded with sunlight, and although the construction is plain and devoid of unnecessary architectural adornment, yet the result is most pleasing.

There are at present about fifteen hundred inmates under institutional care. Everyone is enthusiastic over their work, and the industries are so numerous that every patient can find an outlet for his energies and have the best of his abilities developed.

A great feature is made of the playgrounds and entertainments generally, and during my visit most of the children we found occupied in manufacturing the things necessary to celebrate their Christmas in as happy a way as possible. Their gymnasium work was surprisingly good, and eve boxing bouts were going on. The intention is eventually when the building is completed to have a segregation of the sexes, and that is done as far as possible at the present time.

Dr. Little is strongly of the opinion that the boys who have been instructed in different vocations are much better afterwards if they receive a year or two of instruction on the farm or in the garden where they learn habits of patient industry and discipline that are simply invaluable to them when they leave the institution.

The great majority of the patients are of the higher grades, although a few idiots and low grade imbeciles are received. No less than one hundred patients are on parole at the present time, and a certain number of them always succeed in winning their way into communities where they can be of some use. Of course, this requires the development of a carefully detailed follow up system.

The question of research is not being overlooked, and although the medical staff is smaller than it might be, yet some interesting research work is being carried on by Dr. Potter, who is an unusually bright assistant. He is making a careful investigation of the endocrine imbalance and personality, and has already issued some interesting literature.

Letchworth may be taken as a model in the development of proposed schools for mental defectives in connection with the Department of Public Health, in Toronto, and in the various

provinces of Canada. A striking point is that the majority of the teachers are young and enthusiastic, and have imbued their pupils with the same optimism that pervades themselves.

C. K. CLARKE

HANDBOOK OF CHILD WELFARE IN CANADA

MARKED interest has been shown in this Handbook, which is to be published shortly by the Department of Health of Canada. There are in each province, six or seven different members of the Government under whose direction work for child welfare, in the modern acceptation of that term, is carried on, and it is from the official reports of these Ministers, and with their co-operation and assistance, that the handbook has been compiled and edited by Dr. Helen MacMurchy, Chief of the Division of Child Welfare in the Department of Health.

It goes without saying that the two chief leaders in work for child welfare are the Minister of Education and the Minister of Health. In addition, juvenile courts are under the charge of the Attorney General; orphanages, industrial schools and other institutions for children are usually in the Provincial Secretary's Department; and the Women's Institutes or Home Makers' Clubs or Cercles des Fermieres which are a subdepartment or extension department of the Department of Agriculture, are also doing a great deal of work for child welfare. Mothers' Pensions are administered under the direction of the Provincial Secretary or the Provincial Treasurer or by the Workmen's Compensation Board: the Minister of Labour also directs certain efforts for child welfare.

It is intended that the Handbook will give a general view of all this work, and so will be valuable as a book of reference. It will be possible to ascertain, by consulting it, not only what work is being carried on for child welfare in Canada, but also how, by whom, and under what government direction this work is done. There will also be information about voluntary societies which have for their object the furtherance of child welfare.

A table giving the birthrate, infant mortality, and maternal mortality for all Canada compiled by the Dominion Bureau of Statistics will also appear in the Handbook. As this is the first time that these figures have ever been available, this table will increase the value of the Handbook for purposes of reference.

Renal Colic in Cases of Renal and Ureteral Stone.—Of the thirty-two patients admitted to the hospital for renal or ureteral calculus whose cases are analyzed by Henry H. Morton, J. Sturdivant Reed, John H. Burke and William B. Tatum, Brooklyn, thirty stated that they had come for the relief of pain. Twenty-seven described their pain as paroxysmal in character, starting over one kidney and radiating along the course of the ureter or remaining localized in the kidney region. Of the others, one complained of dull pain in the lumbar region; one had abdominal pain, first diagnosed as an acute condition of the abdomen; another patient sought relief for backache, which had been diagnosed as due to spondylitis. Two of the patients who later proved to have calculi had had no pain or colic that they could recall, and were sent to the hospital for the relief of other symptoms, viz., pyuria. The duration of colic in this series presented a wide variation: in one case there had been an attack three days before admission and none before, while two of the patients had had repeated attacks for twelve years. The remaining patients had had attacks extending over three or four years before admission; this was found to be a fair average of the duration of colic. The authors urge that an early and complete urologic and roentgenologic examination should be made in every instance in which stone is suspected. Early operative intervention is indicated as a measure of prevention against destruction of the kidney. Stone in the kidney, if allowed to remain, eventually results in total destruction of the organ. Small calculi should be observed for a reasonable time before operative removal is attempted. Many of them will pass spontaneously or can be assisted by repeated dilation of the ureter.—*Jour. Am. Med. Assoc.*, November 11, 1922.

Men and Books

MEDICINE IN THE CENTURY BEFORE HARVEY

In the last Harveian oration, Mr. Arnold Chaplin, librarian of the Royal College of Physicians, of London, has given us an interesting account of medicine in the centuries before Harvey. At the beginning of his lecture he referred to the great precision with which Harvey indicated his aims in founding this oration, which he was very desirous should serve as a stimulus to keep alive in the minds of its members and Fellows the importance of searching and studying out the secrets of nature by experiment, and also of maintaining the honour of the profession by the promotion of mutual love and affection. When Harvey, in 1656, attached to his bequest these two fundamental commands, the peculiar condition of scientific and political thought rendered both equally important. Until the dawn of the sixteenth century it might be asserted that the study of medicine had made little advance in Europe, since the Greek period which closed with the age of Galen. But with the revival of learning towards the end of the fifteenth century came a far reaching change in the attitude of students towards the study of medicine and of science. Hitherto they had been content to accept all that had been sanctioned by authority. Few had been competent to determine whether the texts they read were exact translations from the original authors or merely corrupt compilations. Owing partly to manuscripts brought back by the Crusaders, and more abundantly to the unlocking of the literary treasures of Constantinople when Mahomet burst through its gates and took possession, a dissemination of Greek learning was taking place throughout Europe. Greek scholars fleeing from the Turks took up their abode in Italy. Ships coming from the Golden Horn carried priceless manuscripts which their victorious enemy, caring nothing for the learning of the Infidel, had spurned. Italy wel omed the scholar refugees, and the Italian universities were soon busily engaged in the study of the new folios. Learning revived, and with it medicine and science began to be studied in a manner calculated to produce solid and lasting results. Students flocked to Italy from every part of Europe, but of all those who made a pilgrimage to the shrines of the new learning the great figure of Thomas Linacre, the founder of this College, possesses for us an absorbing interest. Already proficient in the Greek language, in Italy he placed himself under the best classical teachers of the time, and while engaged in the study of the old Latin masters he became interested in medical writings, and after a residence at Padua he graduated at its University. The writings of Galen appeared to have already strongly attracted him for in after years he confined his attention chiefly to that author and devoted his unrivalled scholarship to the purpose of providing correct and elegant Latin translations of the more important of his works. To Linacre, however, belongs a greater honour than any he obtained as a scholarly translator, for impressed with the facilities afforded in various universities throughout Europe and especially in Padua he founded the College of Physicians of London, the first institution devoted to the advance and conservation of medical science in Great Britain. Padua, then nearing the zenith of its fame and activity had had a profound influence upon his mind. He had felt in this city the first pulsations of intellectual life and its strivings to pierce into the unknown. The care at that time bestowed on the study of medicine by the universities and by the state in Italy deeply impressed him, and when in after years he resolved to improve the condition of physic in his own country, it was after the Italian model that he shaped this college. We in looking back through more than three centuries of turmoil in politics but nevertheless great advance in knowledge, recognize gratefully the characteristics strongly impressed on our college by its founder; those of high purpose and of catholicity of spirit. Toward the end of Linacre's life he designed a further scheme for promoting the study of medicine in the sister universities, and although its practical application fell far short of the intention of its founder, the credit belongs to Linacre of the attempt to improve the facilities for the study of medicine in the universities of Oxford and Cambridge. In these later days, the funds of the Linacre lectureships at Oxford are now devoted to the teaching of physiology, while

at Cambridge, his own College of Physicians has been entrusted with the duty of promoting the study of anatomy so earnestly desired by the founder.

John Caius, like Linacre, was a scholar. He had trodden the same paths in Italy in his quest for learning, and afterwards spent his life in promoting the cause of science and medicine. Although a type of the scholar-physician he was the first in England to write a treatise on clinical medicine. Natural history also claimed his attention, and he was also one of the first to write on that subject. In common with Linacre, Caius was strongly attracted to the writings of Galen, and spent much of his time when in Italy in carefully examining the manuscripts of that author. But he was not cast in such a rigid mould as Linacre, and there is evidence in his writings that his mind was undergoing the emancipation inevitable with the ever-widening scope of scientific knowledge taking place in his day. When in Italy he lodged with Vesalius and acquired from him a taste for anatomy, and on his return lectured on anatomy before the barber-surgeons, and may thus be regarded as an early promoter of the study of anatomy in Great Britain.

These scholar-physicians of whom Linacre and Caius were shining examples, in spite of their limitations occupied no inglorious position in the history of medical and scientific advance. They restored to the profession the writings of the old masters in a pure text; and they were deeply imbued with a strong desire to benefit mankind by advancing knowledge. Linacre's desire took form in the foundation of this College of Physicians and John Caius in the college bearing his name in Cambridge. A. D. B

The Course of Mortality From Cancer in Baltimore.—To obtain a good understanding of the survey made by William Travis Howard, Jr., Baltimore, the original paper should be consulted. In closing, he says: If it were practicable to investigate the course of cancer mortality for each particular organ or part, even if no more thoroughly than it has here been possible to do for cancer of the breast and uterus, it would be found that cancer is not increasing in either incidence or in mortality among those actually exposed to risk. So far as Baltimore is concerned, the evidence at hand is insufficient to prove conclusively that there has been no actual increase in the mortality rates from cancer of all organs taken together, at least it renders this doubtful. It does show beyond all question of doubt that cancer mortality in Baltimore has not increased in any degree approaching that indicated by the crude rates. For cancer of the only two organs, the breast and the uterus, for which rates approaching specificity could be obtained, it has been shown that in the forty years ending in 1920, mortality has not increased, and that during the latter half of this period there has occurred a gradual but very significant decline in the death rate, which, in the absence of other satisfactory explanation, it seems safe to ascribe to medical activities.—*Jour. Am. Med. Assoc.*, January 13, 1923.

Essential Haematuria.—According to C. P Van Nes, in addition to the ordinary causes of renal haemorrhage (such as tuberculosis, stone or tumour, and acute nephritis), general or local renal congestion (so-called renal varix) may be responsible for haematuria. Chronic nephritis or acute glomerulo-nephritis may be the cause of the bleeding. Haemorrhage from the kidney without any anatomical lesion, or so-called essential haematuria, if it occurs at all, is very rare. The diagnosis of haemorrhage from a healthy kidney can even be made clinically, but is only possible after careful naked-eye and microscopical examination of the kidney in question. Unilateral haemorrhagic nephritis has been repeatedly observed, although the absolute proof, consisting of comparative examination of both kidneys, is still wanting. Nephrectomy in these cases is only indicated in the event of dangerous haemorrhage. Nephrotomy or removal of portion of the kidney for examination is, according to the literature, a good operation, since it is only by this means that other causes can be excluded, and the operation may have a favourable effect upon the haemorrhage. *B. M. Jour.*, December 16th, 1922.

Correspondence

THE TREATMENT OF GOITRE

The Editor, The Canadian Medical Association Journal, Montreal.

Dear Sir:

In the December number of your joural you published three articles on goitre which I am sure were of the greatest interest to your readers. The contributors dealt very fully with surgical treatment, but they seem to have been unaware of the progress that has been made in x-ray and radium-therapy in hyperthyroidism. All three writers were of the opinion that radium would not produce a permanent cure. There is at the present time a large field of literature, covering histories of hundreds of cases, which is quite sufficient to convince an impartial observer that there are, relatively, as many cures by radium as there are by surgery. From this literature I shall cite a few extracts in order to show what has been done in the sphere of radiumtherapy.

Burrows and Morrison (*Proc. Roy. Soc.*, 1920) state: "In 100 consecutive cases treated with radium 'perfect' results were obtained in twenty and 'good functional' results in twenty. In forty cases the condition was improved. Twenty patients gave up treatments and were not benefitted."

The London Radium Institute report for 1920 states: "Prolonged irradiation with the gamma rays will often prove of great use when routine medical treatment has failed.....The treatment is sometimes followed by a definite exacerbation of all the symptoms, and it seems fair to attribute this to an increased outflow of the thyroid secretion into the blood stream. Such exacerbation, however, proves transient, and is usually followed by a gradual but steady and definite improvement in the patient's symptoms and general condition, and this may probably, almost certainly, be ascribed to the action of the rays bringing about an arrest of the vitality and retardation in the development of the actively proliferating cells, thus restoring the output of the cellular secretion more nearly to normal limits. With this there is also associated a fibrosis of the connective tissue of the gland, causing the organ to become firmer and smaller."

The Manchester and District Radium Institute in 1921, reports 180 cases treated, fifty-two of which were recorded as cured,—all symptoms and signs of disease having disappeared, except sometimes slight exophthalmos, for over two years, only one recurrence being recorded.

Clagett (*Ill. Med. Jour.*, 1920), reports forty-seven cases treated with radium, six of whom were recurrences after operation. In all cases he obtained decrease in pulse rate from twenty to fifty beats, disappearance of nervous symptoms and tremours and gain in weight, but the exoph thalmos tended to persist.

Quigley (*Med. Herald*, Sept., 1921), states that the results in Graves' disease with radium are so prompt and decisive that there can be no doubt as to the beneficial effects. He considers that no patient with simple or toxic goitre should be submitted to operation without first being given the benefit of radium treatment.

In a paper on "Radiation and Thyroid Disease" (*Jour. Rad.*, July, 1921), Soiland states: "It is not the intention of the writer to decry surgery, or to detract one iota from the many brilliant results obtained by competent operators, but the fact must not be lost sight of that in radiation we have a proved therapeutic agent, far superior to any other given us up to the present time."

Loucks, in a paper on the use of radium in this condition, states (1922): " 'The physiological findings after radium treatment' could be reported *en masse* by stating that there was a general return to the normal of all pathological manifestations. The merits of radium treatment are strikingly shown in the number of our cases where the metabolic rate was taken before treatment and every three months after. Some were normal in three months, others nine months after treatment."

We have been treating this condition at the Radium Institute, Toronto, for twelve years. In the early part of this period the type of case which was suitable for radium treatment was not established, and radium was often used with little success, but from this long experience we now feel confident in stating that in toxic adenoma, toxic goitre, hyperthyroidism, exophthalmic goitre, Graves' disease, or whatever nomen-

clature may be used to designate this condition, radiumtherapy has shown its unique value in treatment. We have had at least 150 cases which corroborate singularly well the views above expressed, all of which views are the result of years of intensive study of this condition.

There is another point which none of the writers to your journal have considered, namely, the application of radium to cases of toxic or exophthalmic goitre that are bad surgical risks. In these particular cases the application of radium has perhaps its best field, for the patient may be brought back again to a condition in which operative procedure may, if necessary, be safely undertaken. The experience of all those who have written on the subject seems to be that radium is a very valuable adjunct to the surgeon at all times and that it can of itself secure a permanent cure in a considerable number of cases of toxic and exophthalmic goitre.

Yours very truly,

W. H. B. AIKINS.

The Radium Institute of Toronto,
January 16th, 1923.

CURE FOR SEA-SICKNESS

IT affords me great pleasure to have the privilege of setting forth my experience regarding the "Cure for Sea-Sickness."

In order to strengthen my claims I travelled steerage, thus receiving the full sway of the ship. It was on board the "S.S.Canada" in June, 1919, that I made the experiment. I observed that nearly all cases of this malady occurred at the meal table. When one passenger showed signs of vomiting, several others immediately became affected. The first thing I did before eating, was to sit in a slightly stooped position causing a compression of the abdomen and preventing an internal movement with the sway of the ship. It was this simple discovery which enabled me to partake of every meal with not a trace of sickness notwithstanding the fact that I was in poor health owing to overseas service and that on two previous trips I suffered the ill-effects occasioned by sea-sickness. I noticed that after two days practice of this method I gradually became accustomed to the sway of the boat and gradually resumed my natural position. After each meal I took a brisk walk and on no occasion whatever would I lie down in my bunk till bed-time. I also noticed that when passing through the corridor between the cook-houses and engine room, a sickening odor was emitted from the vapour of the oils in the engine room and their mixing from the vapours from the cook-housees. To one not accustomed to these odors, vomiting was the result. I always closed my nostrils when passing this particular spot, also avoided smoky and overheated rooms. To keep the bowels in regular condition, I ate oranges, apples and peppermint drops, but even without these, I attribute my success to slight compression of the abdomen by sitting in a stooped position and staying at the table for a few minutes after each meal.

Many people would only be too glad to take trips across the ocean if it were not for their dread of sea-sickness.

My cure would benefit humanity, steamship lines, prevent filthy decks and unpleasant odors from vomiting and create more travel on a general scale.

Ottawa, Dec. 28th, 1922. ALEXANDER FACTOR

Abstracts from Current Literature

MEDICINE

Etiology of Rickets. Mellanby, Edward, M.D. *B.M.J.*, November 4, 1922.

Rickets is a disease accompanying growth and is due primarily to defective feeding. Assuming that the diet contains a sufficiency of calcium and phosphorus in a form that can be absorbed, the most potent influence for procuring the proper calcification of bone is a vitamin of the fat soluble A. class.

There is no difficulty in producing rickets in dogs by feeding a diet containing abundant calcium and phosphorus but deficient in fat-soluble A. If either of these salts is deficient, a condition of osteoporosis results, but the development of rickets will depend on the rest of the diet. A certain rate of growth is also essential for the production of rickets, which does not occur in conditions of arrested or retarded growth—such as marasmus.

A child may develop rickets on a poor diet in calcium—but often such a diet will also be deficient in fat-soluble vitamin for these substances are often closely associated in natural foodstuffs, such as milk, egg yolk and green vegetables, whereas flour, rice, potatoes and sugar are almost devoid of both.

A deficiency in phosphorus may be even more important especially if the vitamin is also deficient. Skim milk powder may be used to cure rickets if given in sufficient quantity and with little cereal, probably on account of its high phosphorus content and because it is not entirely devoid of fat-soluble vitamin, but the presence of abundant cereal will tend to aggravate the rachitic process.

Whereas the fat-soluble vitamin working in conjunction with calcium and phosphorus ensures the calcification of bone, other elements in the diet have an influence in promoting the laying down of new bony basis without at the same time ensuring its calcification. The worst offenders in this respect are cereals and carbohydrates. Oatmeal in particular has a greater rickets producing effect than either flour or rice, in spite of having about five times more $P_2 O_5$ than either of the others. Nor does this effect appear to be due to its carbohydrate moiety, for oatmeal has a much lower percentage of carbohydrate than either rice or flour.

The explanation seems to be in the power cereals have of stimulating growth—not only in laying down fat and tissues generally but in producing longer and bigger bones. This makes a greater demand on the calcification process, and if any of the factors essential to sound bone formation are relatively defective, rickets will result. For example: increasing the bread in a diet slightly rickets-producing emphasizes the disease and produces larger quantities of cartilage and osteoid tissue in the bones.

There is no doubt that sunlight possesses an anti-rachitic power—due to its ultra-violet rays. Even tetany, latent or manifest can be cured by ultra-violet rays. Possibly the fat soluble vitamin is liberated into the circulation by the action of such rays upon the skin. This action does not occur when light passes through window glass.

If a diet is well balanced, sunlight will have no definite effect in this regard, but if the diet is deficient, sunlight will tend to inhibit or ameliorate the development of rickets.

Mellanby recommends the following diet for rachitic children:

Milk 1-1½ pints.
Beef drippings 1-2 ounce with bread,
Meat 1-2 ounces mixed with potatoes.
One egg.—One orange.
Milk pudding,

This diet alone will bring about rapid improvement but the process of healing is hastened by the addition of cod liver oil. Clinical improvement with calcification and growth of bone are obvious within a few weeks even without sunlight, exercise or massage. L. M. LINDSAY

The Etiology of Rickets. Findlay, Leonard. *B..M.J*, November 4, 1922.

Investigations into the cause of rickets have been directed along three lines: prophylactic, provocative and curative.

Hess was probably the first to demonstrate that cod liver oil (fat soluble—A.) possessed a marked prophylactic power. The negro infant in New York almost invariably suffered from rickets; yet Hess and Unger by simply admini-

stering cod liver oil were able to prevent this in the majority of cases treated.

While the dietetic theory of the causation of rickets is the most popular at present, the work of Pirquet in Vienna argues against a fat deficiency theory. Fat was almost eliminated from the diet of infants in Vienna during the war, the required number of calories being supplied by carbohydrates. No ill effects were observed from such a diet either in regard to general nutrition or to osseous development.

In India, Hutchison found two classes of society living under totally different circumstances: One was composed of poor labourers and agriculturists, living an open air life. The other, a wealthy class, whose women and children were almost continuously confined to dark, airless apartments. The infants of both classes were breast fed a year or more. The diet of the poorer class was almost devoid of fat, especially animal fat; whereas that of the wealthy mothers contained fat in moderate amounts, as well as milk, eggs and vegetables, which are said to contain the antirachitic vitamin. Yet it was amongst this wealthy class that rickets was most prevalent and the poor class was almost immune. In both classes dental caries was exceedingly rare.

Therapeutic tests were carried out in a London poly-clinic. Here Dr. MacKay was quite unsuccessful in curing active rickets by fats of various kinds. Even large doses of cod liver oil and butter failed to show any beneficial effect.

Keratomalacia is very prevalent in Japan where the diet is notoriously deficient in fat, yet rickets is almost unknown. The converse holds good in Glasgow.

In active rickets fat absorption is as good as in health yet calcium is imperfectly retained, and inorganic phosphorus in the blood is below par.

A certain rate of growth is essential for the development of rickets as it does not occur in marasmus or in coeliac disease. There must be, therefore, some lesion which allows the absorption of elements necessary for growth and at the same time deprives the organism of some other element necessary to regulate this growth.

Findlay is convinced that the development of rickets depends on over-crowding, poor care, lack of fresh air and exercise. The effect of confinement may be due to one of two factors; either deficient exercise or lack of sunlight. The former, he holds is more important than the latter for better results were obtained by keeping rachitic children in Glasgow and carrying out massage than by sending them to the country where sunshine was more plentiful. Rickets is "completely absent" from Iceland where the sun never shines for four months of the year.

Sunlight undoubtedly has a curative effect on rickets. Whether it acts by stimulating metabolism or by virtue of its antimicrobic power is not definitely determined. Sunlight usually means fresh air, ventilation, and diffusion of infection. In fact it would appear that only by enlisting the aid of some virus can one explain not only the geographical and social distribution, but also the seasonal and age incidence of rickets.

In the discussion, Dr. Robert Hutchison (London) stated that few clinicians would agree with Dr. Findlay if he maintained that rickets was a microbic disease.

Rickets has none of the usual characters of such a disease, but suggests a purely metabolic disorder like gout or diabetes. It is quite likely that many factors, dietetic, hygienic, etc., may be able to bring about the general disorder of metabolism called rickets. L. M. LINDSAY

The Heart Action in Spasmophilia. Koplik, M.D. *Trans. Amer. Pediatric Society*, 1922.

Under the term spasmophilia, Koplik includes laryngeal stridor, convulsions, carpo-pedal spasm and attacks of apnoea. Any of these conditions may be either latent or manifest; all are characterized by increased irritability of the peripheral nerves to galvanic current. In the characteristic reaction, the KOC, AOC, and ACC, all occur with a current of less than 5 milliamperes and usually less than 2.5.

Koplik has learned to fear sudden death with attacks of apnoea which may occur apart from any other manifestation of spasmophilia. Escherich was the first to suggest that paralysis of the heart might be the cause of the sudden death. Koplik observed that at the onset of an apnoeic attack the heart suddenly slowed down to one-half or even one-third of the previous rate, then as the attack subsides and the infant begins to breathe again, the heart beats faster and soon attains the normal. During the slowing down stage, the heart is quite regular, but there is a double beat at regular slow intervals. This slowing of the heart is just as characteristic and pathognomonic of spasmophilia as the electrical hyperirritability.

Chvostek's sign is frequently absent in these cases, while an attempt to elicit Trousseau's sign may precipitate a spasm of the larynx or general

convulsion and so is not justified. The cause of the slowing of the heart may be due to an increased irritability of the vegetative nervous system or of the pneumogastric nerve. In all his cases, the x-ray showed enlargement of the thymus gland, so that the sudden death may be associated with so-called status thymo-lymphaticus, yet Koplik does not think the thymus is the essential influence in producing spasmophilia, but believes the parathyroids will be found to be the chief offender. L. M. LINDSAY

Comparative Prognosis in Tuberculous Lesions of the Right and Left Lung. A study of 1,048 cases. Stivelman, B. P., and Miller, N. C. *Am. Jour. Med. Sc.*, July, 1922.

Brown has stated that there is no difference in the gravity of lesions of the left and right lungs. Others have regarded those of the left lung as more serious. Stivelman and Miller have examined 1,048 cases with this question in view. They have found that in early tuberculosis the right side is twice as often affected as the left. But with progression of the disease there is an increase in the number of times the left lung is seriously involved so that in advanced tuberculosis both lungs are involved an equal number of times. In those patients whose graver lesion is on the left side, the disease runs an active course in a greater number of instances than if the predominant lesion is on the right side. In early tuberculosis, the question of which lung is attacked does not affect the general prognosis. The authors try to explain the graver prognosis in cases of serious involvement of the left lung as opposed to that in cases of serious involvement of the right one. The small left bronchus and consequent poorer aeration of the left organ does not seem to them a valid reason. On the other hand, patients bear retraction of the heart and great vessels to the right better than retraction of these organs to the left. Also pulling of the diaphragm and stomach upwards is a serious factor. Interlobar fissures act as a barrier to the spread of the disease to some extent and this inhibiting or confining influence is less potent on the left side where there is only one fissure to cross, than on the right side where there are two.

ARCHIBALD MALLOCH

DERMATOLOGY

Yeast Infections of the Skin. Greenbaum and Klauder. *Arch. Dermat. and Syph.*, Vol. V, No. 3, p. 332.

Stating that of the family of Saccharomyces very few play an active part in Dermatomycoses, excepting superficial thrush infection, the authors report an intensive cultural investigation of the yeast flora of the normal skin taking their cultures from the axillae, inguinal folds and interdigital spaces of the fingers and toes of 150 persons. They obtained and classified three types of saccharomyces and one of cryptococcus and did animal inoculations, obtaining negative results with the saccharomyces but both animal and autoinoculation experiments were positive with the cryptococcus. They report seven cases, six of a few weeks to few months duration and one of eight years. Some of these were pathogenic to animals showing that yeasts like cocci often become pathogenic through passage through a host. The lesions involved the interdigital spaces, one type was dry showing a bright red dermis through a glistening thinned epiderm, the other composed of a mass of undermined sodden epiderm, moist and white in colour. Treatment consists in keeping the hands dry and applications of 10% iodine or 1% chrysarobin and iodine salve. A number of photographs illustrate the lesions and cultures. W. R. JAFFREY

SURGERY

The Physician and Surgeon. Cushing, Harvey. *Boston Med. and Surg. Jour.*, Vol. 187, p. 623; November 2, 1922.

"No one can be a good physician who has no idea of surgical operations, and a surgeon is nothing if ignorant of medicine." Upon this extract from the writings of Laufranchi, the author bases his article. The perfection of many elaborate methods of diagnosis has taken up too much of the physician's time in recent years. Too little time has been spent on therapeutics, which from the patient's point of view is relatively much more important.

Surgical therapy, however, has developed amazingly. A check-rein has been necessary in a few instances to curb its progress.

These two main branches of clinical medicine, although supported by a common foundation, have seemingly wandered wantonly apart. In-

ternists have been too often theorists. The inevitable has happened. The principal object of clinical medicine has been obscured by a mass of ideas, both therapeutic and diagnostic which have accumulated for many decades, and have become debris.

On the other hand, the surgeon has centered his efforts on a part to the detriment of the whole. He has been too frequently a technician.

When physicians acquire a more intimate knowledge of surgery, fewer people will procure the needed operation too late. When surgeons are required to possess a thorough grounding in general medicine, fewer unnecessary operations will be done. H. MAITLAND YOUNG, M.D

Indications for and against Operation in the Treatment of Injuries to the Head. Sharpe, William. *Am. Jour. Surg.*, vol. 36, p. 262, November, 1922.

Even trivial injuries to the head require very careful investigation, especially in children. It is of utmost importance to determine the site of any brain injury, but, it is imperative to ascertain the presence or absence of an increase in intracranial pressure. In relation to treatment, the presence of a fracture is the least important fact to establish, with, of course the exception of depressed fractures. Moreover, early diagnosis is essential. To this end, particular attention should be given to the eye-grounds, and cerebrospinal pressure should be measured with the spinal manometer. Medullary compression, must, if possible, be avoided.

Choked disk does not occur in the presence of shock. The blood pressure, however, rises and remains continuously greater than the intracranial pressure as shock passes off. This produces a dilation of the retinal veins resulting in a retinal oedema. This papilledema or choked disk is an accurate sign of increased intracranial pressure, but as shock often lasts six hours, repeated ophthalmoscopies may be necessary.

Cerebrospinal pressure, measured with a mercurial manometer by lumbar puncture, is even a more accurate sign. The normal pressure is 5-9 m. Hg. Any rise to above 15 m. Hg. is distinctly positive. If one waits for more definite signs the mortality reaches 50% or even more. Lumbar puncture, itself, aids materially in relieving symptoms of a mild increase in intracranial pressure, but if used in subtentorial lesions or high intracranial pressures there is great danger of medullary compression.

Severe shock and medullary collapse prohibit operation. Operations should never be delayed in order to obtain an x-ray plate. These only help in doubtful cases of depressed or latent fractures. Subtemporal decompression is the operation of choice and in the absence of localizing signs should be done on the right side in right-handed persons to avoid the speech centre. If at operation the brain protudes, a similar procedure should be conducted on the opposite side. In a series of five hundred brain injuries, 31% showed signs of intracranial pressure. By careful consideration in regard to the advisability, type and time of operation the mortality was reduced from 50% to 30% by the author. Excluding moribund cases the mortality was 19%.

H. MAITLAND YOUNG

Shall We Decompress for Choked Disk? Sachs, B. *Arch. Neur. and Psych.*, vol. 8, p. 515, November, 1922.

The author bases his article on a series of cerebral tumour cases from his own clinic. Out of 140 cases, forty-five (32%) were unlocalized and ninety-five (68%) localized.

Of the ninety-five cases papilloedema and choked disk were present in sixty-four (67%) and absent in thirty-one. The situation of the tumour, however, had some effect on their incidence. Choked disk was present in seventeen out of nineteen cerebellar tumours (89%). In hypophyseal tumours it was present in three and absent in twelve; in frontal tumours nine out of thirteen cases (69%). It was practically a constant finding in temporo-sphenoidal tumours.

Sachs concludes that the ordinary decompression operation seldom gives satisfactory relief for choked disk. It failed completely in twenty-nine out of thirty-eight of his cases. He believes that one should make every effort to localize and, if possible, eradicate the tumour before relying upon simple decompression for relief in such cases. Too often the decompression operation is discouraging to both patient and surgeon, and before its maximum usefulness is reached it must be made harmless as far as the patient's life is concerned. Moreover, it must not in any way interfere with subsequent successful removal of the tumour. H. MAITLAND YOUNG

Electrocution by 110 Volt Alternating Current. Balthazard, V. *Bull. Aced. de Med.* Paris, Vol. 88, p. 111, October 10, 1922.

In attempting to put out a fire caused by a short circuit, a man whose hands and feet were wet having seized with the left hand a cut end of one of the wires, immediately fell unconscious, with cyanosis and dyspnoea. Death resulted almost immediately in spite of artificial respiration. Small burns were found in the left hand. Owing to the wide contact, none were found on the feet.

Electricity acts on the organism in proportion to the intensity of the current transmitted. This intensity is dependent upon the voltage of the current and the resistance of the organism. It is expressed by the formula $I = E \div R$. (E= voltage, R=resistance). Ordinarily, the body resistance is equal to over 10,000 ohms. With an alternating current of 110 volts the resultant intensity is 11 ma. (milliamperes) which is quite harmless. But the body resistance may be decreased to 1,000 ohms if the points of bodily contact with the wire and with the ground are greasy, moist or immersed in water. Under such circumstances the intensity of the current would amount to 110 ma. Experimentally, 80 ma. will kill a dog and it is probable that 100 ma. will surely kill a man. Cardiac and renal lesions, however, seem to predispose to electrocution.

H. MAITLAND YOUNG

The Relation of Fibrosis and Hyalinization to Longevity in Cancer. A study of 194 cases. MacCarty, William C. *Jour. Lab. and Clin. Med.*, vol. 8, p. 42, October, 1922

There are four factors which tend to increase the postoperative length of life in cancer, viz: lymphocytic infiltration, cellular differentiation, fibrosis and hyalinization. In June 1921, the author published observations on the first two factors in cases of gastric carcinoma. Fibrosis and hyalinization are infrequently seen in gastric carcinoma. Cancers of the breast and rectum, however, more frequently present these factors. Two series of patients, all of whom had died of recurrence or metastasis following radical operations, were studied. The conclusions drawn were:

(1) In cancers of the breast and rectum fibrosis occurs with almost equal frequency.

(2) Cancers of the breast more often show hyalinization than do those of the rectum.

(3) Fibrosis, when present alone, increases postoperative length of life. (34% of cases studied).

(4) Hyalinization, when present alone, also increases postoperative length of life. (40% of cases studied).

(5) When both fibrosis and hyalinization were present postoperative life was increased 56%.

H. MAITLAND YOUNG

Suppurative Osteomyelitis Due to the Colon Bacillus. Winslow, N. *Annals of Surg.*, December, 1922, p. 695.

Colon infection only occasionally passes beyond the confines of the abdominal cavity (Cushing). To date, only seven cases are reported in which colon infection was present in bone suppurations of metastatic origin. Five gave a history of previous typhoid fever. The cases are equally divided as to sex, and age seems to play no part in the incidence. The bones involved were femur, 3, tibia, 1, costal cartilages, 3.

Two cases with mixed infections died. The time of appearance of the lesion was:—as the initial lesion, 1: fourth week of illness, 1: near the close of a typical typhoid, 7: five months after receipt of gun shot wound of bone, 1: twenty years after an attack of typhoid, 1. A. T. BAZIN

Treatment of Acute and Chronic Simple Traumatic Synovitis by Aspirations and Immediate Active Mobilization. McWilliams, C. A. *Annals* of *Surg.* December, 1922, p. 677.

The author considers that the Willems method of arthrotomy without drainage and immediate active mobilization has definitely settled the question of treatment of suppurative arthritis of the knee. He considers that similar treatment is indicated in simple traumatic synovitis of the knee and advocates repeated aspirations with immediate active mobilization of the joint. He decries fixation and rest even in acute conditions and states that the method is followed by needlessly prolonged convalescence. He quotes, *in extenso*, numerous authorities and criticises the plans adopted by them. He illustrates his argument by case reports and concludes, that,

(1) Repeated aspirations combined with active (never passive) motions, and walking without splints afford the best method of treatment in acute and chronic traumatic joint synovitis, provided there be no joint mouse nor dislocated meniscus present.

(2) Aspiration relieves pain immediately, renders a correct diagnosis more certain, prevents stretching and consequent weakening of the ligaments and avoids muscular atrophy.

(3) Such treatment renders unnecessary all other physiotherapeutic measures the effects of which have been overestimated and which have been applied in an irrational and empiric manner and are makeshifts to excuse procrastination.

A. T. BAZIN

Double Lip. Dorrance, G. M. *Annals of Surg.* December, 1922, p. 776.

Double lip may be a congenital deformity but is usually seen after the eruption of the second teeth. The author has never seen it develop after the age of twenty-one. It consists of a redundancy of the mucous membrane, and protrudes from beneath the margin of the upper lip pushing the latter upward. The submucous tissue is always in excess, the labial glands are enlarged. Treatment is resection, local anaesthesia being employed. Diagrams illustrate the steps of the technique. A. T. BAZIN

Submaxillary Salivary Calculus. Buzby, B. F. *Annals of Surg.* December, 1922, p. 778.

Salivary calculus is more frequent in the submaxillary than in the parotid inasmuch as the saliva from the former is much more rich in mineral salts. Infection and stasis are etiological factors. Males are more frequently affected than are females and the age incidence is commonly in the third and fourth decades. The stones may occur in either the gland or in the duct, may be single or multiple and may attain considerable size.

The history of duct stone is typical. A swelling of the gland, painful and tender, occurs coincident with mastication and function. This swelling gradually disappears after cessation of stimulation of function.

In gland stone, the swelling is not intermittent but gradually progressive with increase in pain and tenderness. Diagnosis is determined by bidigital palpation and the x-ray. Treatment consists of intra-oral incision for duct stone, but in removal of gland in gland stone, or associated hyperplasia or abscess of gland. General anaesthesia is advantageous. A. T. BAZIN

Aseptic Resection of Intestine. Collins, F. K. *Annals of Surg.* December, 1922, p. 739. Horine, C. F. Annals of Surg. December, 1922, p. 745.

The two articles deal with a new technique for the aseptic end to end anastomosis of intestine, both large and small. In each instance the procedure has been tested experimentally and clinically and has proven its worth. The descriptions are clear and concise and the steps are adequately illustrated by diagrams. The technique is simple and rapidly carried out with or without an assistant. The articles are well worth the study of those employed in operations on the abdomen. A. T. BAZIN

ANAESTHESIA

Bronchopulmonary Complications Following Operations Under Anaesthesia. Lamb, David. *B.M.J.*, November 11, 1922, p. 915.

Slight cough, with, or without expectoration, and without pyrexia, is common after anaesthesia and is due to irritation of the upper air passages. Sometimes on the day after operation the temperature rises to 100° F., or perhaps higher. There is a sense of discomfort in the chest and cough. After three or four days there is muco-purulent expectoration, sometimes very free. These latter cases are apparently abortive pneumonias. The radiogram shows a distinct shadow, most frequently in the lower lobe of the right lung. Over this area bronchial breathing can generally be heard. The majority of these cases is associated with the pneumococcus, the remainder with the B. influenzae a streptococcus, or with B. mucosus capsulatus. The germs in the mouth and pharynx get mixed up with the excess of mucus and saliva, and infection of the bronchi results.

In addition to this mild type of case, all the ordinary forms of pneumonia and bronchopneumonia may occur. The infective organisms may be carried to the lungs by the blood, the lymph, or by an embolus.

The frequency of pulmonary complication after operation, is hard to determine. When ether has been administered they are attributed to the anaesthetic, but after other anaesthetics they are generally ascribed to other causes. They are undoubtedly most frequent after abdominal operations, especially in the upper abdomen. The restraining effect on respiration of tight

bandages and the inhibitory effect of pain in the wound, are partly responsible.

Of five cases of lobar pneumonia, following operation, investigated by the writer, four were suffering from colds in the head and one had just recovered from influenza at the time of operation. Two had had chloroform and three C2 E3 followed by chloroform alone. All the circumstances of an operation lend themselves to possible chill and exposure, unless constant care and watchfulness are exercised. The wonder is, not that pulmonary complications arise, but that they do not arise more frequently.

Flagg, of New York, is quoted as saying: "It is a quite generally accepted fact in the circles wherein I work that there is no such thing as ether pneumonia, that the post-operative pneumonias which we see are due to exposure before, during and after operation, the development of an infection already present, or of embolic origin. Mikuliez found post-operative pneumonia more frequent after chloroform than after ether and most frequent after local anaesthesia.

A case is quoted in which ether given by the rectum proved fatal in a case of malignant disease of the larynx with signs of excessive irritation of the bronchial mucous membrane.

Postoperative pleurisy, empyema and abscess of the lung, are usually associated with subdiaphragmatic abscesses connected with septic gall bladders or appendix cases, or they result from emboli from other septic areas.

Abscess of the lung is of occasional occurrence after tonsillectomy, though rare after other operations, even when extensive, in the mouth and throat.

Pulmonary embolism and infarctions are met with in patients over forty-five and usually after abdominal operations. The site of thrombosis is usually in the iliac or femoral vein or in the inferior vena cava.

Among the various measures recommended for the prevention of broncho-pulmonary complications, perhaps the most important is the postponement of an operation if there are any signs or symptoms of nasal or bronchial catarrh.

If the operation cannot be postponed every care must be taken to prevent the patient catching cold. Ether should be avoided. In abdominal or breast cases, bandages should be applied lightly. In mouth cases especially, the patient should be kept on his side after the operation. In cases of intestinal obstruction with vomiting, the stomach should be washed out before the operation and, if necessary again before recovery of consciousness.

W. B. HOWELL

Obstetrical Anaesthesia from the Anaesthetists View Point. Coburn, Raymond C. *New York State Jour. of Med.*, November, 1922, p. 499.

The advantages of nitrous oxide over other anaesthetics in labour are several. There is no extra strain thrown on the organs of elimination. Contraction of the uterus is stimulated and labour shortened. The patient's vital forces are conserved. The effects of nitrous oxide are quickly secured and elimination is so prompt that the patient is subjected to its influence only during the time it is needed. The baby is not affected.

Analgesia is obtained by giving nitrous oxide with a larger percentage of oxygen than is used for anaesthesia. Much of the success in the use of nitrous oxide depends on the patient's attitude and her power to cooperate.

The time when the administration should be begun differs in different patients, but it is generally, in pluriparae, when there is three or four finger dilatation of the cervix. In primiparae it is usually a little later and sometimes not until the beginning of the second stage.

At the beginning of a contraction the mask is quickly applied and the patient is told to take three or four deep inhalations, and then to hold her breath as long as possible, and bear down. Holding the breath prevents the rapid loss of gas through exhalation, and bearing down, by increasing the intrapulmonary pressure, increases the rate of absorption. At the same time the expulsive force is increased. Later when the contractions become more painful, six or eight or even ten breaths of nitrous oxide must be taken. Only sufficient gas should be given to produce analgesia, so that voluntary efforts can be made. In this way the duration of labour is materially shortened. It is important to avoid cyanosis.

When the contractions are too strong, considering the resistance to be overcome, nitrous oxide analgesia should not be used. It is better then to use ether or chloroform.

If an anaesthetist is not available, the patient may be taught to apply the face piece of an automatic apparatus herself.

When intermittent analgesia is employed there is no difficulty with the baby. When, in addition to the analgesia, ether or chloroform is used, there is less difficulty than when these

agents are so used without the preceding analgesia.

Whenever the baby is cyanotic at birth and the cord is still pulsating, several inhalations of pure oxygen by the mother before the cord is tied will quickly improve the child's colour.

W. B. HOWELL

The Action of Stovaine and Novocaine upon the Bulbar Centres. (Action de la Stovaine et de la Novocaine sur les Centres Bulbaires.) Camus, Jean. *Paris Medical*, March 11, 1922.

The writer injected solutions of stovaine and novocaine directly into the neighbourhood of the bulb in dogs with a view to finding a means to treat cases of spinal anaesthesia, where the bulbar centres are affected.

He found that these substances have a selective action on the respiratory centre. Kymographic tracings are shown, demonstrating the gradual cessation of breathing. After cessation, stimulation of the central end of the cut pneumogastric had no effect. Previously this had caused accelerations of the respirations. Properly performed artificial respiration re-established the normal rhythm and then stimulation of the vagus had the same effect as before cessation. Other centres retain their activity for a while after the respiratory centre is paralysed. During periods of artificial respiration when this was temporarily stopped the variations in arterial pressure and in the rate of the heart could be demonstrated on the kymograph.

In dogs which have received a dose slightly smaller than the usual fatal dose, the respiratory centre being to a certain extent affected, any slight shock, such as that due to a change in position, would cause death from syncope. In less serious syncope caffeine seemed to act as an antidote. If the minimum fatal dose is exceeded, caffeine will not start respiration.

The writer considers caffeine a very useful adjunct to artificial respiration in the treatment of accidents due to stovaine and novocaine.

Artificial respiration must be regular and rhythmical. He has seen breathing reappear after an hour in dogs.

W. B. HOWELL

The Effect of Magnesium Sulphate on the Secretion of Bile.—Experiments were undertaken by Emmett B. Frazer, Rochester, Minn., in order to determine whether magnesium sulphate introduced directly into the duodenum or into the circulation would cause any change in the volume or in the character of the bile. The technique employed was simple and easily executed. When the common duct was cut at its entrance into the duodenum, any nerve path which might have passed by this route was also severed. If a nerve reflex was dependent on such a route it would have been abolished. It was found that the rate of flow of bile in the control experiments was more uniform when the animals were fasting; therefore, any fluctuation in the rate of flow after the injection of magnesium sulphate could best be determined in the fasting state. After intraduodenal injection of magnesium sulphate, the duodenum, which was clearly visible through the skin, at first contracted and then remained markedly relaxed for from thirty minutes to one hour. This initial contraction was probably due to mechanical stimulation by introduction of the needle and the solution. The results of these experiments were entirely negative. When magnesium sulphate solution was injected directly into the duodenum of dogs or injected into the circulation, there was neither acceleration of the rate of flow of bile, nor change in the colour. In many instances the rate was even somewhat retarded. When bile was injected into the duodenum, there was a definite, prompt, increase in the flow of bile.—*Jour. Am. Med. Assoc.*, November 4, 1922.

History of Experimental Scarlet Fever in Man.—Ludvig Hektoen, Chicago, presents a brief review of the recorded attempts to produce scarlet fever experimentally in man, which reveals that it is exceedingly doubtful whether a single positive result has been obtained. In view of the ease with which scarlet fever appears to be transmitted under natural conditions and the not infrequent occurrence of surgical scarlet fever, Hektoen says the failure of the efforts at experimental transmission is a perplexing problem that awaits solution.—*Jour. Am. Med. Assoc.*, January 13, 1923.

News Items

GENERAL NEWS

Dental Surgeons on the outlook for early signs of Malignant disease.—More than 6,000 dentists from all parts of North America when they gathered at their Annual Meeting in Chicago, were cautioned to be on the outlook for early signs of malignant disease. Every dental patient, whether he asks for it or not, should be examined for any lesions in the mouth which might develop malignancy, before work is begun on the teeth. With the full co-operation of dentists throughout the country, 50 to 75 per cent of patients having growths or mouth lesions can be "cured without awaiting the hideous mutilation which results when a developed growth is removed," Dr. Daniel U. Hoffman declared. "The man or woman who has a sore or canker on the tongue or cheek that does not heal within a couple of weeks has received a decided warning. The cold sore on the lower lip that is found in inveterate pipe or cigarette smokers is a danger sign that must be heeded." The value of the campaign of prevention was stressed by Dr. John H. Cadmus, "Although years and years of research and millions of dollars have been spent in the attempt to discover the cause of cancer, no one knows the cause," said Dr. Cadmus. "We do know that it is more prevalent in this latitude, however, and, realizing that it must be detected and removed at the beginning to avoid the horrible disfigurement necessitated by cutting away flesh around cancerous lesions to prevent fresh growth, we have decided to make the dental profession the first line of defence against the disease." Dr. Cadmus spoke in opposition to the popular impression that radium can be used to cure cancer. "It is used in internal and especially malignant growths where an operation would result in death, but it cannot cure," Dr. Cadmus asserted. "At most it can only check the growth of the disease." The number of deaths caused by cancer each year in the United States is estimated to be 50 per cent greater than the total number of American troops killed in the world war. G. H.

NEW BRUNSWICK

The appointment of Dr. E. J. Ryan to the commission which governs the General Public Hospital gives a much needed greater representation on the Board to the Medical Profession. For years there were always four and sometimes five doctors on the commission of nine with a medical man as superintendent. Gradually this was changed so that until this appointment was made there were only two medical men on the board—one of whom has long since ceased to practice, the other being the Minister of Health whose multitudinous other duties made it impossible for him to devote much time to the hospital. This condition of affairs in conjunction with a non-medical superintendent was rather unsatisfactory and it is hoped that in future appointments, the Medical representation will be increased until at least a majority of the Commission will be familiar with hospital affairs.

A campaign to stamp out Venereal Diseases is soon to be staged in New Brunswick under the auspices and guidance of the Ministry of Health. As far as can be learned it is to be put over without any help from the medical men of the province, at least none of them are amongst the officers or those present at the meeting for organization. The only doctor holding office is a doctor of philosophy. He will prove his worth if he is able to guide their train of thought so as to avoid the making of impossible and impracticable suggestions; but that is almost too much to expect from a lay committee on which medical representation is denied. Mrs Emmeline Pankhurst of suffragette fame in England is the headline attraction and her reputation and personality will no doubt attract crowded houses.

The Health officials of this province evidently do not want or need the co-operation of the profession. The statute book is being filled with health laws of which enforcement is not being attempted (i.e. reporting of venereal cases etc.); the municipalities are fighting others in the courts and one is almost led to believe that there must have existed a Ministry of Health when Virgil wrote: —"Quos Deus vult perdere prius dementat."

The sympathy of the profession is being extended to Dr. W. D. Rankine of Woodstock who recently lost by fire his office, library, house and contents. The family were considered fortunate in escaping from the burning building, so fast did the flames advance. Happening just before Xmas on a bitterly cold morning (over 30 degrees below zero) it caused even more distress than such a destructive blaze ordinarily would. That it did not daunt our worthy confrere was made evident by the fact that a few days later he notified the programme committee that he would contribute a paper on "The Septic Ear" at the Maine—New Brunswick joint meeting.

The standardization of the St. John hospitals necessitated the revision of the conditions under which physicians practised in them. To deal with the matter the staff of the General Public Hospital—the largest hospital in the Maritime Provinces—appointed a committee consisting of Dr. John S. Bentley, Chairman and Drs. G. A. B. Addy and E. J. Ryan to draw up regulations which conformed to the requirements of standardization and to which all doctors desirous of practicing in the hospital must subscribe. The committee had great difficulty in ascertaining just what was required by other hospitals, but finally after a large amount of correspondence and work had been done by Dr. Bentley, formulated the following regulations. They were accepted *in toto* by the Commissioners of the hospital and hereafter all men priviliged to practice in it must sign a declaration to the effect that "they agree to abide by the rules and regulations of the General Public Hospital, a copy of which has been submitted to them." Knowing the difficulty (or rather the impossibility) of getting a ready made set of regulations the writer feels that these are worthy of publication in the Journal as they may form at least the groundwork on which other hospitals newly standardized may build.

REGULATIONS

1. No physician or surgeon who divides fees will be allowed to practice in the hospital.
2. Where possible autopsies shall be held, and the autopsy records shall be filed with the case records.
3. The pathological, bacteriological and *x*-ray findings shall be filed with the case records.
4. The physical examination shall be made and recorded by the house officer.

5. In all cases the attending physician or surgeon shall be held responsible for the records of his patients.

6. A tentative diagnosis shall be made in all cases within 48 hrs of admission.

7. In surgical cases the surgeons pre-operative diagnosis shall be posted in advance of operation.

8. The post operative diagnosis shall be recorded immediately after the operation; all tissues removed shall be sent to the pathological laboratory for report.

9. Follow up records shall be kept by a record clerk.

10. Throat smears and other examinations in regard to infections shall be made of all children admitted to the children's department. Vaginal smears shall be made in suspicious cases.

11. It shall be the duty of the chiefs of service to instruct the house officers at the bedside upon the salient points of diagnosis and upon the management of cases

12. The superintendent shall keep a record of the house officers regarding their personal conduct and professional ability.

13. A committee of five shall be appointed annually by the commissioners on the recommendation of the staff, and this committee shall require that the proper methods of efficiency be maintained throughout the hospital.

14. A meeting shall be held each month of the entire medical staff. A written notice shall be sent to each member three days before the date of meeting. Failure to attend three consecutive meetings without an excuse acceptable to the staff will be followed by a recommendation to the commission for the dismissal of the delinquent from the staff.

15. At each meeting the clinical experience of the group in the various departments of the hospital shall be reviewed and analysed, the basis of such review and analysis being the clinical records of all patients, both pay and free.

16. A summary of the month's casualties such as deaths, infections and complications, shall be prepared by a committee of the staff for the use and convenience of the group meetings, and this summary shall become a part of the permanent hospital records.

17. The staff shall consist of all registered practitioners of the City and County of St. John who have subscribed to the hospital regulations and have obtained the privilege of treating patients in the hospital.

18. The officers of the staff shall be a chairman, a vice-chairman, and a secretary, The chairman and the secretary shall be members of the hospital medical board. In addition to his regular duties the secretary shall keep a record of the attendance at meetings.

19. The officers of the staff shall be elected by nomination and ballot at the regular meeting in December, and shall assume office at the first meeting in January.

20. The order of business at staff meetings shall be:—

(a) Presentation of interesting pathological material collected through the month, with remarks by the pathologist.

(b) Reading the casualty report and discussion of same by physicians and surgeons responsible for the case or cases in question as well as by others.

(c) Opportunity for report of cases of special interest which have been treated during the month. E. J. R.

QUEBEC

Dr. C. F. Martin of Montreal, is at present in Europe but is expected to return to Montreal early in February.

At a special meeting of the Medical Association of the East of Montreal held Wednesday, January 10th, the proposals of certain Companies to insure the individual clientele of members of the profession who took stock in their Company was discussed, and it was finally resolved that the Medical Association of the East of Montreal as a body resolves to have no professional dealings with Companies proposing unethical relations between patients and the profession, and request the Secretary to forward a copy of this resolution to all Medical Journals.

New Hospital in Quebec Planned.—The Hospitalieres Sisters, who have been administering the Hotel Dieu in Quebec, since the first days of the colony, have accepted charge of a new hospital to be erected on Ste. Foye road, in the new parish of the Holy Sacrament. This parish is in charge of the fathers of the Holy Sacrament of Montreal. The present Hotel Dieu is too small to handle the increasing number of cases and the new one will be used as a general hospital.

Jail and Big Fine for Fake Doctors.—Amendments to the Quebec Medical Act approved by the Lower House, were approved in the public bills committee of the Legislative Council after a number of the proposed changes had been slaughtered, largely through representations by osteopaths of the province. As finally approved anyone who assumes the title of doctor without qualification, whether in newspaper advertising or by other means, is liable to fines ranging from $50. to $200. Improper advertising of this character, too, carries three months in jail as well as the $200. fine for any offence subsequent to the second. The big fight on the bill staged by the osteopaths was on the proposed clause that: "Without previously obtaining authorization from the Lieut-Governor-in-Council, it is forbidden to keep an institute, private hospital, home for convalescent or sick persons, maternity hospital or establishment where consultations and treatments are given." That was dropped after a lawyer of Montreal, had waged the osteopaths' fight in committee.

Osler Collection.—The Medical Library at McGill University will be permanently enriched before the end of this year by the addition of the collection of books on the history and development of medicine, numbering in all some 8,000 volumns, bequeathed by Sir William Osler, to McGill School of Medicine in his will. The collection which is now being arranged and catalogued at Oxford University, England, will be brought out to Canada by Sir William's nephew, Dr. W. Francis, who will remain in charge of the collection at McGill after its installation in a room in the New Medical Building which has been specially remodeled for its reception. Sir William Osler's bequest makes McGill Medical School the possessor of the finest collection of its kind in the American Continent. It includes a large number of valuable old manuscripts, and old works collected all over Europe, and will add greatly to the prestige of McGill. The collection is expected to reach Canada in the latter half of this year

G. H.

ONTARIO

The Southern branch of the Simcoe County Medical Society met in Alliston, on December 14th, 1922. The President for the ensuing year will be Dr. A. F. McKenzie, and the secretary, Dr. J. M. Walker. Dr. Gwyn, of Toronto, spoke on the "Diagnosis of Pneumonia and Empyema."

The Federation of American Societies for Experimental Biology held their annual meeting in Toronto, on December 26, 27, 28, 29. A highly interesting programme was presented. Of special importance was the joint session of the physiological, biochemical, pharmacological and pathological societies. At this session many of the problems in the treatment of diabetes by Insulin were taken up. Papers were presented by Drs. Banting and Best, by Professor Macleod, and other members of the physiological department. Many tributes of commendation were given to Dr. Banting and his co-workers by the visiting scientists, and it was evident that the interest of the continent at large has been attracted by the recent discoveries in this line in the Toronto laboratories. Many remarkably interesting papers were presented in other sections and there was an unusually large attendance at all the demonstrations. A special visitor at the meeting was Professor R. Barany, of the University of Upsela.

The Niagara District Medical Society met at Welland on January 4th. Considerable business which will be discussed later, business dealing with the reorganization and reformation of the county societies, was transacted. Dr. T. C. Routley, of Toronto, the secretary of the O.M.A., addressed the meeting in the above connection, and Dr. Gwyn, of Toronto, spoke on the "Diagnosis and Treatment of Pneumonia and Empyema."

Obituary

Dr. Peter Alexander McDougal, one of Ottawa's oldest practitioners, died on December 10th, in his 83rd year.

Dr. Charles McKenna died in Toronto on January the 8th, aged 78. He had graduated from the Toronto School of Medicine in 1865, and had been in continuous practice in Toronto since then.

Dr. Henry Hollingsworth Moorehouse, one of the oldest practitioners of the Province, died in Oakville, on Saturday, December 23rd.

Dr. D. W. McPherson, died in Toronto, on January the 3rd, in his 51st year. A graduate of the old Trinity Medical School, Dr. McPherson had long practised in Toronto, and had established a large practice, which he unselfishly sacrificed in the beginning of the war to go overseas as the commanding officer of No. 2 Field Ambulance. With this unit he went to Salisbury Plains and subsequently to France, and was with the Canadians in all their early activities. He was later transferred to England, and placed in charge, first, of Lady Astor's hospital, at Taplow, and later at the Ontario Hospital, at Orpington. Prior to his service overseas, Lt. Colonel McPherson had been for many years a member of the Militia and had been commanding officer of the old 11th Field Ambulance. For his services in the war, services of the highest order, Colonel McPherson was awarded the honour of C.M.G.

Urinary Infection.—A. S. Roe considers that absorption of bacteria into the blood, obstruction to the urinary outflow, and disturbances in metabolism producing a highly irritating urine, are the three factors concerned in the production of urinary infection. While these may operate either singly or in conjunction, the last appears to be the most important from the point of view of preventive medicine. In the majority of cases the urine is definitely acid, while fatigue is a prominent factor in determining an attack, and the disturbance in metabolism, by producing a highly irritating generally acid blood, impairs kidney efficiency and lowers resistance. The elimination of bacteria which have been absorbed into the blood from such foci as the bowel, teeth, tonsils, pelvis, etc., also takes place through the already damaged kidneys, producing still further damage, with a resulting renal infection. Similar infection also follows from the presence of bacteria alone if there is obstruction to the urinary outflow from stricture, stone, prostatic disease, etc., though in obstinate cases foci of infection must be sought for as well. The physiological conditions tending to cause disturbances in metabolism are those associated with deficiencies in diet, disorders of internal secretions connected with pregnancy, puberty, and the climacteric, and physical or mental disturbances resulting from fatigue.—*Med Jour. of Australia,* October 14th, 1922.

Book Reviews

Diseases of the Heart A handbook for students and practitioners. By I. Harris, M.D. Demy 8vo, pp. xii+196, 56 figures in text. Price, 10s6d. London, Bailliere, Tindall and Cox, 1922.

In this little volume, the author, who is Honourary Physician to the Liverpool Northern Hospital and in charge of the cardiographic department, outlines the general principles of cardiology, including clinical methods of investigation and treatment. It is an excellent small manual giving in concise form a summary of present day knowledge of symptoms and treatment of heart disease.

J. H. E.

Diseases of Infancy and Childhood. Their dietetic, hygienic and medical treatment. By Louis Fischer, M.D. Ninth revised edition. Published by F. A. Davis Company, Philadelphia, 1922, in two volumes. Volume 1, treats of infant feeding and the organic diseases, with 146 illustrations and thirty-seven colour plates.

The author has endeavoured to cover the subject of pediatrics in this work, but many of the descriptions are incomplete. A number of the subjects treated do not refer to the most recent works, while Volume II is occupied almost entirely with the infectious diseases, a rather uneven division of the subject of pediatrics.

A. B.

Principles and Practice of Infant feeding By Julius H. Hess, Chicago. Published by F. A. Davis Company, Philadelphia.

This book follows the usual type of text on infant feeding and, with few exceptions, portrays the accepted thought and principles laid down in this branch of work. The author commences with a concise description of the anatomy and physiology of the digestive tract of the infant, and follows with a complete description of maternal nursing and a discussion of artificial feeding and foods. The chapter on metabolism is especially to be commended to the student as the recent findings in this branch of the work are carefully tabulated. The latest work on the deficiency diseases is well presented. The appendix contains a good list of all infant foods, diets, food recipes, and weights and measures.

A. B.

The Process of Diagnosis including the Method of History Taking and Physical Examination of Surgical Cases. By E. Stanley Ryerson, M.D., C.M. Price, $1.00. University of Toronto Press, 1922.

This small volume of about one hundred pages of text has been written by an experienced teacher with the aim of instructing the student entering on the study of clinical surgery in the proper method of arriving at a correct diagnosis, always an essential prelude to successful treatment. He emphasizes the importance of system, of close observation, and of concentrated attention; all most important in securing correct results. He describes the difficulties to be overcome in history taking and details the standard methods of inspection, palpation, percussion and auscultation as demanded in surgical practice. The last few pages of the book are occupied by a list of the more important recent books suitable for the student's reading or reference, not only on general surgery but also in its various special departments. The book is to be commended to all students as presenting in small compass the important facts which must be mastered by them. It is of convenient size to be carried in the pocket, and used for reference when at work in the ward.

A. D. B.

The Medical History of the War which is to appear in twelve volumes under the general editorship of Major-General Sir W. G. Macpherson, K.C.M.G., M.B., will form a part of the *History of the Great War based on Official Documents*. The volumes under preparation will appear under the following titles: General History of the Medical Services (4 volumes), The Diseases of the War (2 volumes), The Surgery of the War (2 volumes,) the Hygiene of the War (2 volumes), Pathology and Medical Research during the War (one volume), Medical Statistics and Epidemology (one volume). The general desire in the medical world for a medical history of the war in accessible form was first brought to notice by Professor Adami, in September, 1914, in a letter to Sir Wm. Osler, in which he pointed out that in none of its wars had Great Britain thoroughly worked up its medical history. This letter was forwarded to the Director General of the Medical Services in November, and prompt action was taken in the matter. More than 38,000 war diaries, in addition to a large number of reports from commands at home and overseas, and administrative files from the theatres of war were registered and filed at the office of staff appointed for the work. We have received recently the first volume of the General History of the Medical Services, the first volume of the Diseases of the War, and the first volume of the Surgery of the War. The subsequent volumes will receive notice as they appear.

History of the Great War—Medical Services, Diseases of the War. Vol. 1. Edited by Sir W. G. Macpherson, K.C.M.G., Colonel T. R. Elliott, C.B.E., D.S.O., F.R.S., and Lieut-Colonel Andrew Balfour, C.B., C.M.G. London; H.M. Stationery Office, or through any bookseller, 1922. Medium, 8vo, pp. viii+550; 6 coloured plates and other illustrations, £1 1s. net. Canadian Agents: The British Commonwealth Publishing Co., 61 College St., Toronto.

Two volumes will be devoted to the medical diseases of the war. The later volumes will discuss nervous disorders, venereal and skin diseases, medical aspects of aviation, gas warfare and mine gas poisoning. Separate volumes as noted in a previous review will deal with Hygiene and Pathology, yet much detail of preventive treatment and pathology appears here. It is not a text book on the subjects presented but rather an historical record and is based upon the work done during the progress of the war. The final nature of the invalidism produced by many diseases cannot for obvious reasons be discussed now but must await a study of the documents in the hands of the ministries of pensions and of re-establishment. The chapters covering the different disease groups under consideration have been prepared by officers who had special knowledge and experience of the diseases of which they write, most of them of consultant standing, their posts giving them access to all official documents, while their active service work was to a great extent confined to the special branches of medicine allotted to them. The diseases dealt with in this volume comprise the infections other than venereal, the deficiency diseases, scurvy, beri-beri, famine dropsy and pellagra, nephritis and cardio-vascular disorders.

We learn that the hospital admissions for disease in theatres other than France were 14.6 times as numerous as those for wounds. In 1918, the admission rate for disease was 533.1 per 1,000 strength. In England, in 1919, a peace year, the admissions were 378.4 per 1,000. These figures show the importance of disease as a cause of inefficiency in an army, and indicate the vast expense which it entails. A study of the figures prepared from the casualty clearing stations in one of the armies in France, in 1916, reveals that the group of diseases including scabies, skin diseases, boils and inflammations of connective tissue account for about twenty-five per cent. of admissions. That is, about one quarter of the sick wastage was due to simple skin lesions most of which were scabies or some form of pyodermia largely preventible by careful inspection and attention to cleanliness of the men. A second group including pyrexia of uncertain origin, trench fever, myal-

gia and rheumatism accounted for another twenty-five per cent. Most of these were trench fever cases, and Colonel Soltau considers from his study of these two groups that forty-four per cent. of the total admissions were due to diseases caused by dirt or lice and therefore preventible.

The practical value of research to an army in the field is illustrated by the observations on trench fever which was recognized in 1915 and proved to be infective by the inoculation of volunteers early in 1916. Had that method been pursued at the time, the pathology of the disease and the means by which it was spread would soon have been discovered, but the use of volunteers for the needful experiments at the time was not permitted, and accordingly these discoveries were postponed till 1917-1918, when, with the help of sixty or seventy volunteers, the American pathologists settled the question in three months. The delay probably meant that about 200,000 cases might have been prevented had the experiments taken place earlier.

The war has shown the immense service which original research can render to preserve the efficiency of an army, whether carried out at home or in the actual area of military operations. The mobile bacteriological laboratories played a large part in the fresh discoveries of medicine and surgery, though designed chiefly as aids to diagnosis and special treatment.

One great lesson of the war as amply demonstrated by the facts presented, is that the medical side of planning a campaign is just as necessary for efficiency as the military and the neglect of it must inevitably lead to an enormous amount of preventible and therefore unjustifiable wastage. Wherever one opens the book one finds much of interest and of value, both to the medical officer and to the physician in practice whether it be concerning influenza, the diseases due to unbalanced dietary as seen in the Mesopotamian campaign, or cardio-vascular disorders. The editor and his collaborators deserve great praise for the work they have presented us, the value of which is enhanced by a generous bibliography appended to each chapter and a copious general index. J. H. E.

History of the Great War, Based on Official Documents. Medical Services General History, Vol. 1. By Major-General Sir W. G. Macpherson, K.C.M.G., C.B., LL.D. pp. xv+463, 23 maps and charts. Price, £1, 1s. London, H.M. Stationery Office, 1921.

This first volume of the series of four promised on the History of the Medical Services, contains in its opening chapters an account of the preparation in peace of the Medical Services for war, dealing with organization, personnel and training. Then follows the story of mobilization and a chapter on hospital accommodation in Great Britain, with an outline of the disposal of sick and wounded in the British Isles. The development of the examination of recruits, of recruiting of the Medical Services, and of medical training, leads up to the story of medical stores and of surgical equipment. Sanitary organization, and demobilization complete the chapters which deal with the Medical Services at home. The remaining chapters begin the story of the Medical Services overseas. Those found in this volume comprise principally the garrisons in the Mediterranean, in the West Indies, Mauritius, the far East, West Africa and South Africa. References to the work of the services of the Dominions are promised in the succeeding volume on the Medical Services with the Expeditionary Forces in France and in the other theatres of war. Various tables of interest appear as appendices, including the Medical Units mobilized in August, 1914, the Military Hospital Ships and Ambulance transports and their time in service, a list of sixteen hospital ships destroyed by enemy submarines and mines, and tables of the sick and wounded arriving in the United Kingdom from the various expeditionary forces and garrisons overseas.

The enormous scale upon which personnel and equipment had to be provided and maintained is suggested in the statements that over 1,000,000 clinical thermometers were issued, that the dental services indented for four million artificial teeth, nearly 700 tons of plaster of Paris and thirteen and one-half tons of dental rubber. In 1916, over twenty-three tons of quinine was issued, and in the malarial season of 1917, the average amount was over six tons each month. The editor is to be congratulated upon the success with which he has given us a picture of the Medical Services as gathered from War Office files, the reports of parliamentary and other committees, the reports of administrative officers and specialists, the reports of hospital units and other sources. The succeeding volumes will be awaited with interest. J. H. E.

Clinical Electrocardiography By Frederick A. Willius, M.D. The Mayo Clinic, Rochester, Minnesota. 8vo., pp. 188, with 185 illustrations. Philadelphia; W. B. Saunders Company, 1922. Cloth, $5.50 net, Canadian Agents: The J. F. Hartz Co., Limited. Toronto, Ont.

In this monograph the author presents in concise form a summary of the subject under review. Following a consideration of the physiology of heart muscle and its nerve control, he outlines the principles of the electrocardiograph, illustrating both the Cambridge and the Hindle models and the method of application. The normal electrocardiogram is then explained with an elucidation of the mathematical basis of electrocardiography. The remaining three-fourths of the text is devoted to the clinical application of this study with many illustrative electrocardiograms. The arrhythmias, tachycardias, and disorders of conduction are illustrated, then follows a discussion of the abnormalities of the T wave and the P wave, with a presentation of the results of study of congenital heart conditions, and various heart diseases with some consideration of the changes found in patients with hyperthyroidism, myxoedema, angina, and diseases of the aorta and pericardium. The mortality incidence in the various types investigated at the Mayo Clinic is a valuable contribution to the study of prognosis. There is a short bibliography of important references appended to each chapter. J. H. E.

Books Received

International Clinics Volume IV, thirty-second series, 1922. Edited by Henry W. Cattell, A.M., M.D., with the collaboration of Chas. H. Mayo, M.D. 301 pages, illustrated. Published by J. B. Lippincott Company, 201 Unity Building, Montreal.

Text Book of Pediatrics Edited by Prof. E. Feer, translated and edited by Julius Parker Sedgwick, B.S., M.D.; and Carl Ahrendt Scherer, M.D., F.A.C.P. 852 pages, with 262 illustrations. Published by J. B. Lippincott Company, Philadelphia, and Unity Bldg, Montreal, 1922.

Generalized Pain Clinical symptomatology of internal diseases. By Professor Dr. Norbert Ortner, Vienna. 569 pages. Published by The Medical Art Agency, New York.

Diseases of the Heart. By John Cowan, D.Sc., M.D., F.R.F.P.S., and W. T. Ritchie, O.B.E., M.D., with a chapter on The Ocular Manifestations of Arterial Disease by Arthur J. Ballantyne, M.D., F.R.F.P.S. 585 pages, illustrated. Price, 30s. net. Published by Edward Arnold and Co., 41 Maddox St., London, W.

Medical History of the War, Surgery, Volume II. Edited by Major-General Sir W. G. Macpherson, K.C.M.G., C.B., LL.D., Major-General Sir A. A. Bowlby, K.C.B., K.C.M.G., K.C.V.O., Major-General Sir Cuthbert Wallace, K.C.M.G., C.B., and Colonel Sir Crisp English, K.C.M.G. 579 pages, illustrated. Price, 26 shillings, post free. Published by His Majesty's Stationery Office, Imperial House, Kingsway, London, W.C.2, 1922.

Electric Ionization. A practical introduction to its use in medicine and surgery. By A. R. Friel, M.A., M.D., F.R.C.S.I. 129 pages, illustrated. Price, 8 shillings net. Published by John Wright and Sons, Limited, Bristol, Eng.

A Laboratory Handbook of Bio-Chemistry By P. C. Raiment, B.A., M.R.C.S., L.R.C.P., and G. L. Peskett, B.A. 100 pages. Price, 5s. net. Published by Edward Arnold and Co., 41 Maddox St., London, W.

Physiology for Dental Students By A. G. Curzon-Miller, B.Sc., L.M.S.S.A., F.C.S. 199 pages, illustrated. Price, 10s., 6d. Published by Edward Arnold and Co., 41 Maddox St., London, W.

The History of Medicine. By Walter Libby, M.A., Ph.D. 413 pages, illustrated. Price, $2.00. Published by Houghton Mifflin Co., New York. Agents, Thos. Allen, 215 Victoria St., Toronto.

Practical Physiology By E. P. Cathcart, M.D., D.Sc., F.R.S., and others. 343 pages, illustrated. Price, 18s. net (and in two volumes, 10s. 6d. each). Published by Edward Arnold and Co., 41 Maddox St., London, W.

La Guerison de la Tuberculose Pulmonaire. By Le Dr. R. Burnand. Published by J. B. Bailliere et Fils, 19 Rue Hautefeuille, Paris.

Practical Chemical Physiology. By W. W. Taylor, M.A., D.Sc. 68 pages. Price, 4s. 6d. net. Published by Edward Arnold and Co., 41 Maddox St., London, W.

Text Book of Ophthalmology. By Hofrat Ernst Fuchs; authorized translation from the 12th German edition, completely revised and reset, with numerous additions by Alexander Duane, M.D. 955 pages with 455 illustrations. Published by J. B. Lippincott Company, 201 Unity Building, Montreal.

Diseases of the Ear, Nose and Throat. Medical and Surgical. By Wendell Christopher Phillips, M.D. Sixth revised edition, 854 pages, illustrated with 578 half-tone and other text engravings, and 37 full plates, some in colours. Price, $8.00 net. Published by F. A. Davis Company, Philadelphia.

Premature and Congenitally Diseased Infants. By Julius H. Hess, M.D. 388 pages, illustrated with 189 engravings. Price, $5.50. Published by Lea and Febiger, Philadelphia.

Manual of Diseases of the Nose and Throat. By C. G. Coakley, A.M., M.D., F.A.C.S. Sixth edition, revised and enlarged. 635 pages, with 145 engravings and 7 coloured plates. Price, $4.25. Published by Lea and Febiger, Philadelphia.

Manual of Gynaecology. By John Osborne Polak, M.Sc., M.D., F.A.C.S. Second edition, thoroughly revised. 378 pages, illustrated with 139 engravings and 10 coloured plates. Price, $4.50. Published by Lea and Febiger, Philadelphia.

Vitamines and the Choice of Food By Violet G. Plimmer and R. H. A. Plimmer, D.Sc. 154 pages, illustrated Price, $2.50. Published by Longmans, Green and Co., Toronto.

Aspects of the Tuberculosis Problem.—With growing knowledge of its etiology and manifestations has come greater mastery over its ravages. The day is not far past when a diagnosis of consumption—a malady that was killing one-seventh of all people born under civilization—was equivalent to signing a death warrant. Nevertheless, the problem of meeting this enemy of mankind has been faced with resolution and with a reasonable measure of success. Sunshine, food and fresh air have had their advocates in this connection. The outcome of the various proposals, whether they concern treatment in the home or in the sanatorium, has been decidedly encouraging; yet, despite the seemingly favourable progress, there is no unanimity of opinion with regard to some of the most fundamental factors in the tuberculosis problem. An illustration is afforded by the changing views with respect to the mode of infection in tuberculosis. As Landis has recently remarked, for some years the trend of opinion was strongly in favour of the alimentary mode of infection, and many experimental studies were carried out which seemed to support this belief. Within the last few years, however, the pendulum has swung back in favour of the inhalation theory. One is probably safe in saying that infection through the intestinal tract, while accountable for some cases, is of minor importance as the portal of entry. The occurrence of primary intestinal tuberculosis is, of course, well recognized, particularly in children. Their intestinal mucous membrane seems to be especially permeable, and the infection in them appears to be due to the bovine bacillus, presumably derived from milk, which has entered through the gastro-intestinal tract. On the other hand, there are abundant statistics to indicate that pulmonary tuberculosis is almost always caused by the human type of tubercle bacillus.—*Jour. Am. Med. Assoc.*, December 30th, 1922.

Psychologic Effects of Tobacco Smoking:—Few subjects have aroused such unsatisfactory discussion as has been given to the effects of tobacco smoking. Whereas the "antis" of various sorts place the responsibility for everything from stunted growth to mental deficiency on this habit, its users praise the "delicious weed" as the most soothing of habits, and even assign it a place in medicine as a harmless sedative. Recently the department of psychology of Johns Hopkins University undertook a study of the immediate psychologic effects of tobacco smoking. Eight established psychologic tests were used to determine whether or not the smoking of cigars or cigarettes would influence the judgment and response of a number of persons to various stimuli. The results seem to indicate strongly that the immediate effect of smoking, both on smokers and non-smokers, is a lowering of the accuracy of finely co-ordinated reactions (including associative thought processes). However, against this must be set, according to D. J. Carver, who conducted the experiments, the possible decreased accuracy of the habitual smoker when he has for some hours been deprived of his customary tobacco-combustion products. There is no indication that the speed of complicated reactions is affected by smoking, nor is there indication that thoroughly mechanized reactions requiring no fine motor adjustments are affected. It is proposed to continue to experiment extensively with more refined methods and technique. Investigations by these observers and, in fact, all experiments thus far reported on this question indicate that we have no really scientific evidence on which to base a valuable opinion as to the psychologic effects of the tobacco habit.—*Jour. Amer. Med. Assoc.*, Dec. 9, 1922.

Mild Smallpox.—On more than one occasion recently, The Journal has drawn attention to the virulent trend of smallpox. The situation cannot be overemphasized, in view of the recent experience at Denver. That the remotest community is not immune, and that the cloak of mildness may hide for a time the real nature of the disease already present, is exemplified in the report of the county health officer of Biloxi, Miss., noted in *Public Health Reports*, December 29th, 1922: We have had nine cases of chickenpox reported. Chickenpox makes us think of smallpox, so I went to investigate and located a genuine case, confluent in type, resulting fatally. The victim, Dr. Fetters, a chiropractor, of Biloxi, recently from Denver, had never been vaccinated. Biloxi has had a number of mild cases of smallpox durng the past few years, and some citizens are not being vaccinated as they should. A few cases like the one mentioned above would help to persuade them of the effectiveness and necessity of vaccination.—*Jour. A.M.A.*, January 6th, 1923.